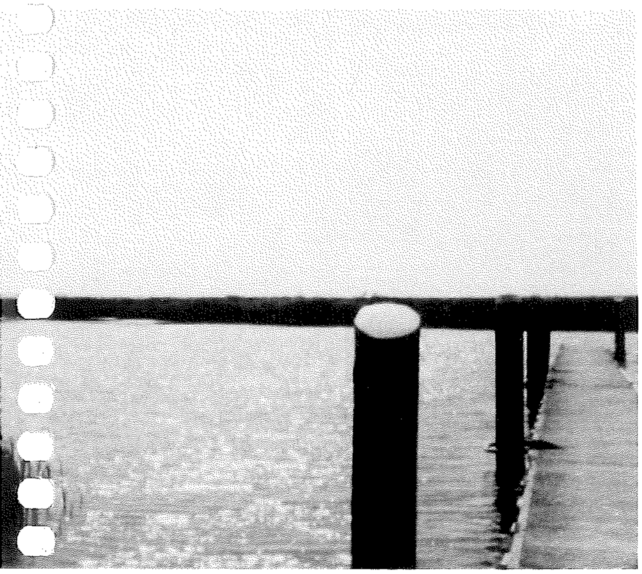


FINAL ENVIRONMENTAL IMPACT REPORT

VOLUME I: FINAL ENVIRONMENTAL IMPACT REPORT

State Clearinghouse No. 2007082071

Alviso Slough Restoration Project

November 2009

Santa Clara Valley Water District

TC
425
A48.A4
2009f
v.1
c.2
LIBRARY

Santa Clara Valley Water District

ALVISO SLOUGH RESTORATION PROJECT
Final Environmental Impact Report

PROJECT NO. 30154029

Prepared By:

EDAW | AECOM

Under the Direction of:

Bal Ganjoo, P.E., Senior Project Manager
Debra Caldon, Unit Manager, Environmental Planning Unit
Mike Coleman, Planner of Record
Capital Program Services

Katherine Oven, P.E.
Deputy Operating Officer
Watershed Capital Division
Acting Chief Operating Officer

Beau Goldie
Chief Executive Officer

November 2009

Final Environmental Impact Report

Table of Contents

Volume I

List of Acronyms and Abbreviations .... **iii**

Introduction **1**

A. Report Organization 1
B. Environmental Review Process 3

Section 1 June 2009 Recirculated DEIR Comments and Responses **RTC-1**

Section 2 June 2008 DEIR Comments and Responses **RTC-25**

A. Master Responses RTC-25
B. Individual Comments and Responses RTC-31

Section 3 Final EIR [DEIR revised to included public comments]

Executive Summary ES-1
1. Introduction 1-1
2. Description of the Alternatives 2-1
3. Environmental Setting, Impacts, and Mitigation Measures 3-1
   3.1 Hydrology and Geomorphology (HYD) 3.1-1
   3.2 Water and Sediment Quality (WQ) 3.2-1
   3.3 Biological Resources – Aquatic (AQBIO) 3.3-1
   3.4 Biological Resources – Terrestrial (TERRBIO) 3.4-1
   3.5 Public Health and Vector Management (VECTOR) 3.5-1
   3.6 Geology and Soils (GEOL) 3.6-1
   3.7 Hazards and Hazardous Materials (HAZMAT) 3.7-1
   3.8 Air Quality (AIR) 3.8-1
   3.9 Noise (NOI) 3.9-1
   3.10 Land Use and Planning (LAND) 3.10-1
   3.11 Recreation (REC) 3.11-1
   3.12 Cultural and Historic Resources (CUL) 3.12-1
   3.13 Transportation and Traffic (TRANS) 3.13-1
   3.14 Public Services (PUBSER) 3.14-1

3.15 Utilities (UTIL) 3.15-1
3.16 Aesthetics (AES) 3.16-1
3.17 Social and Economic Effects, including Environmental Justice (SOCIOEC) 3.17-1
4. Growth Inducement and Cumulative Analysis 4-1
5. Mitigation Monitoring and Reporting Program 5-1
6. List of Preparers & Reviewers 6-1
7. References 7-1
8. EIR Distribution List 8-1

Volume II Appendices

EIR Appendices

Appendix A	Notice of Preparation and Scoping Comments
Appendix B	Water and Sediment Quality Background
Appendix C	Fish Species of Management Concern – Status and Life Histories
Appendix D	Air Quality Calculations
Appendix E	Noise Calculations
Appendix F	Traffic Impact Analysis

FEIR RTC Appendices

Appendix I	Minutes of the Public Hearing for the Draft EIR and Draft Engineer's Report (July 16, 2008)
Appendix II	Best Management Practices List
Appendix III	Legacy Mercury Concentrations in Alviso Slough
Appendix IV	Hydraulic Modeling and Analysis of Project Alternatives

LIST OF ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
ABAG	Association of Bay Area Governments
APCO	Air Pollution Control Officer
AWTF	Alviso Water Task Force
BAAQMD	Bay Area Air Quality Management District
BAOS	Bay Area Ozone Strategy
BCDC	San Francisco Bay Conservation and Development Commission
BMP	Best Management Practices
Board	Board of Directors
BOD	Biological Oxygen Demand
c.y.	cubic yard
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEPA	California Environmental Protection Agency
Caltrans	California Department of Transportation
CAP	Clean Air Plans
CARB	California Air Resources Board
CCAA	California Clean Air Act
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act (Superfund)
CESA	California Endangered Species Act
cfs	cubic feet per second
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CSLC	California State Lands Commission
District	Santa Clara Valley Water District
EIR	Environmental Impact Report
EMS	Environmental Management System
ER	Engineers Report
FEMA	Federal Emergency Management Agency

GHG	greenhouse gases
HAPs	hazardous air pollutants
I	Interstate
IPCC	Intergovernmental Panel on Climate Change
ISP	Initial Stewardship Plan
lb/day	pounds per day
LGRP	Lower Guadalupe River Flood Protection Project
MACT	maximum available control technology
MEI	Maximally Exposed Individual
MTC	Metropolitan Transportation Commission
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for HAPs
NMFS	National Marine Fisheries Service
NMHC	non-methane hydrocarbon
NO	nitric oxide
NO_2	nitrogen dioxide
NOA	Notice of Availability
NO_X	nitrogen oxides
NPL	National Priorities List of CERCLA (Superfund site)
OAP	ozone attainment plans
OEHHA	Office of Environmental Health Hazard Assessment
OPR	Office of Planning and Research
PAH	polycyclic aromatic hydrocarbons
PM	particulate matter
PM_{10}	respirable particulate matter
$PM_{2.5}$	fine particulate matter
ppm	parts per million
Refuge	Don Edwards San Francisco Bay National Wildlife Refuge
ROG	reactive organic gases
ROW	State Right of Way
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SB	Senate Bill

SBSP	South Bay Salt Pond
SBYC	South Bay Yacht Club
SCVWD	Santa Clara Valley Water District
SFBAAB	San Francisco Bay Area Air Basin
SFBT	San Francisco Bay Trail
SIP	State Implementation Plan
SMHM	Salt Marsh Harvest Mouse
SMP	Stream Maintenance Program
SO_2	sulfur dioxide
SR	State Route
TAC	toxic air contaminant
TMDL	Total Maximum Daily Load
TPY	Tons Per Year
$\mu g/m^3$	micrograms per cubic meter
UPRR	Union Pacific Rail Road
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VTA	Santa Clara Valley Transportation Authority

This page intentionally left blank.

Introduction

Section 3 of this Final EIR includes text changes to the Draft EIR that were necessary to address the public comments, clarify the project or to make minor corrections. These changes are presented in underline and strikeout format. Text shown in underline format is new text added to the Draft EIR. Text shown in ~~strikeout~~ format is text deleted from the Draft EIR. Comments to the Draft EIR raised a number of requests that required clarification or further information than that provided in the Draft EIR. Specifically, edits were made to:

- Section ES Executive Summary
- Section 1 Introduction
- Section 2 Description of the Alternatives
- Section 3 Environmental Setting, Impacts and Mitigation Measures
    - 3.1 Hydrology and Geomorphology
    - 3.2 Water and Sediment Quality
    - 3.3 Biological Resources (Aquatic)
    - 3.4 Biological Resources (Terrestrial)
    - 3.7 Hazards and Hazardous Materials
    - 3.10 Land Use and Planning
    - 3.11 Recreation
    - 3.13 Transportation and Traffic
- Section 4 Growth Inducement and Cumulative Analysis
- Section 5 Mitigation Monitoring and Reporting Program
- Section 7 References

Appendices have been moved to Volume II of the Final EIR. Volume II contains the appendices to the Draft EIR [Appendices A- F] and four appendices that include information to address public comments; these are:

- Appendix I: Minutes of the Public Hearing for the Draft EIR and Draft Engineer's Report (July 16, 2008);
- Appendix II: District Best Management Practices List;
- Appendix III: Legacy Mercury Concentrations in Alviso Slough; and,
- Appendix IV: Hydraulic Modeling and Analysis of Project Alternatives.

B. ENVIRONMENTAL REVIEW PROCESS

On June 10, 2008, the District Board of Directors (Board) approved the release of the Draft EIR for the Alviso Slough Restoration Project (State Clearinghouse No. 2007082071) for a 45-day public review period (June 13, through July 28, 2008). The comment period was extended to August 15, 2008 at the request of the County of Santa Clara Parks and Recreation Department and National Marine Fisheries Service (NMFS), to enable these agencies to complete their review and comments.

The District provided a Notice of Availability (NOA)[1] notifying the public of the publication of the Public Draft EIR and of a Public Hearing on same. This notice was mailed to the individuals and organizations that have been involved in the Alviso Restoration Project planning effort as well as those who previously requested such notice in writing. The NOA was also published in the San Jose Mercury News on June 13, 2008. Copies of the Public Draft EIR, ER, and the Notice of Completion were also sent to individuals requesting the information and the Public Draft EIR was made available for review at local libraries and at the District headquarters and posted on the District's website:

- Alviso Branch Library, 5050 North First Street, San Jose, CA;
- Martin Luther King, Jr. Library, 150 E. San Fernando Street, San Jose, CA; and

A public hearing was held on July 16, 2008 at the George Mayne Elementary School in Alviso to present the proposed Project and receive comments on the Public Draft EIR and ER. More than 70 verbal comments were received from the public, with many supporting the project and some raising concerns about the environmental effects of the various project alternatives. Appendix I of the Final EIR includes the minutes of this public hearing, which document the comments received from the public.

Section 3.2, Water and Sediment Quality, of the Draft EIR was re-circulated for public review for 45 days, between June 16 and July 30, 2009. Copies of the Public Draft EIR Section 3.2 recirculated document and/or the Notice of Completion were sent to interested parties. Copies of the recirculated Draft EIR Section 3.2 were also available for public review on the District's website and were available for public review at two local library branches listed above.

The Tables below list all persons and organizations that submitted comments on the Recirculated Draft EIR-June 2009 and the Public Draft EIR-June 2008 during the comment period, the date of the letters, and the initials used to identify each letter. It should be noted that several comment letters were received after the close of the comment period by agencies who requested additional time to prepare their comments. These comment letters are included in this document and responses were prepared.

---

[1] Located in Appendix A

Persons and Organizations that Submitted Comments on the Recirculated Draft EIR

COMMENTER	CODE	AFFILIATION	DATE
State Agencies			
Margarete Beth, Environmental Specialist	RWQCB2	San Francisco Estuary Project and Regional Water Quality Control Board, San Francisco Bay Region	7/31/09
County and City Agencies			
Elish Ryan, Park Planner	SCPRD3	County of Santa Clara Parks and Recreation Department	7/21/09
Organizations and Individuals			
Carin High, Vice-Chairperson; and Eileen P. McLaughlin, Shoreline Watch for San Jose	CCCR2	Citizens Committee To Complete The Refuge	7/30/09
Libby Lucas	None too late for response	California Native Plant Society	9/08/09

Persons and Organizations that Submitted Comments on the Public Draft EIR

COMMENTER	CODE	AFFILIATION	DATE
Federal Agencies			
G. Mendel Stewart	USFWS	United States Department of the Interior, Fish and Wildlife Service	7/28/08
Dick Butler, Santa Rosa Area Office Supervisor	NMFS	United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service	8/15/08
State Agencies			
Ellen M. Corbett, Senator	EC	Senate, California Legislature	7/18/08
Charles Armor, Regional Manager, Bay Delta Region	DFG	California Department of Fish and Game	7/28/08
Gail Newton, Chief Division of Environmental Planning and Management	SLC	State Lands Commission	7/28/08
Lisa Carboni, District Branch Chief Local Development – Intergovernmental Review	DOT	State of California Department of Transportation	7/28/08
Dale Bowyer, Section Leader Southeast Watershed Section	RWQCB	Regional Water Quality Control Board, San Francisco Bay Region	7/28/08
Terry Roberts, Director	SCH	State Clearinghouse	7/29/08
Terry Roberts, Director	SCH2	State Clearinghouse	7/30/08
Regional Agency			
Patrycja Bossak, Bay Trail Planner	SFBT	San Francisco Bay Trail	7/18/08

COMMENTER	CODE	AFFILIATION	DATE
Michelle Burt Levenson	BCDC	San Francisco Bay Conservation and Development Commission	8/01/08
County and City Agencies			
Elish Ryan, Park Planner	SCPRD1	County of Santa Clara Parks and Recreation Department	7/28/08
Elish Ryan, Park Planner	SCPRD2	County of Santa Clara Parks and Recreation Department	8/15/08
Janis Moore, Planner II	SJ	City of San Jose Department of Planning, Building, and Code Enforcement	7/24/08
Organizations and Individuals			
Bob Power, Executive Director	SCVAS	Santa Clara Valley Audubon Society	7/21/08
Florence M. LaRiviere, Chairperson; and Eileen P. McLaughlin, Shoreline Watch for San Jose	CCCR	Citizens Committee To Complete The Refuge	7/28/08
Libby Lucas	LL1	--	7/09/08
Diana Foss	DF	--	7/28/08
Libby Lucas	LL2	--	7/23/08
Robert W. Gross	RWG	RWG & Associates	7/28/08
Libby Lucas	LL3	--	8/09/08
Russ Robinson	RR	South Bay Yacht Club	7/15/08

This page intentionally left blank.

Response to Comments

This page intentionally left blank.

RWQCB2-RD

From: Margarete Beth [MAbeth@waterboards.ca.gov]
Sent: Friday, July 31, 2009 9:47 AM
To: Bal Ganjoo; Mike Coleman
Cc: Dale Bowyer; Bill Hurley
Subject: RWQCB – Comments on Recirculated DEIR – Alviso Slough Restoration Project.

Thank you for allowing the Water Board to comment on the Recirculation Draft Environmental Impact Report Section 3.2: Water and Sediment Quality for the Alviso Slough Restoration Project, dated June 2009 (recirculated DEIR). Below are my comments on the recirculated DEIR.

1. The recirculated DEIR states the "...the focus of the discussion is on potential water and sediment quality impacts to sensitive beneficial uses associated with wildlife, aquatic and, rare and endangered species habitats under the rational that minimizing or avoiding impacts such uses would likely prevent impacts to the remaining uses." The recirculated DEIR does a great job by providing a more thorough discussion of water and sediment quality impacts. In addition, the recirculated DEIR does a good job in proposing adequate BMPs (sediment/silt screens) during project activities to avoid and minimize water quality impacts. However, the data used in the recirculated DEIR is regional and "near" project area and therefore, cannot necessarily be utilized to assess impacts of proposed project activities. The recirculated DEIR further states that sediment testing will be conducted in the project area to assess existing conditions. Water Board staff agrees with the District's plan to do sediment testing within the project site to have a more accurate understanding of existing conditions. This data can be used to determine impacts to water and sediment quality resulting from project activities and furthermore, propose adequate mitigation for such impacts. RWQCB2-RD-1

2. The recirculated DEIR indicates a trend of higher concentrated contaminated sediment as depth increases. As proposed in the recirculated DEIR, project activities may result in exposed sediment with higher concentrations of contaminants than present prior to construction. The recirculated DEIR does a good job in reclassifying water quality impacts to better reflect and address such impacts in the recirculated DEIR. In addition, the recirculated DEIR does provide more details of proposed mitigation for such impacts, such as over-excavating the contaminated sediment to a level of lower contaminant concentrations. Impact WQ-3 (Potential to increase net methylmercury production and bioaccumulation in the food web), which has been re-classified from Class III to Class I, indicates that the impacts have been set as significant and cannot be mitigated to a level of less than significant. Post-project exposed sediment with higher contaminant concentrations of reactive mercury available for methylmercury formation decreases water quality and may adversely impact beneficial uses. The recirculated DEIR proposes two mitigation options: inform the public of such methylmercury elevations, and create a tidal marsh or wetland off-site. The Water Board encourages the District to further study other methods of mitigating mercury impacts if high concentrations are discovered after testing. The recirculated DEIR does not clearly RWQCB2-RD-2

indicate how long it will take for sediment deposition to cover the exposed sediment at the current anticipated rates.

RWQCB2-RD-2

3. Provided an explanation on how the proposed Pond A8 notch will improve DO and "mitigate potential adverse affects on Alviso Slough". In addition, notch flow can be reversed to/from Pond A8. This should be taken into consideration assessing DO impacts and methylmercury formation.

RWQCB2-RD-3

I look forward to receiving your response to comments on the recirculated DEIR and the DEIR (May 2008) and to proposed project changes as discussed at the meeting held at the RWQCB office in May 2009.

Margarete Beth
Environmental Specialist
San Francisco Estuary Project and
San Francisco Regional Water Quality Control Board
1515 Clay St., Suite 1400
Oakland, CA 94612
mabeth@waterboards.ca.gov
Phone: 510-622-2338
Fax: 510-622-2501

Regional Water Quality Control Board

The following addresses the Regional Water Quality Control Board comments concerning the Recirculated Section 3.2 of the Alviso Slough Restoration Project Draft Environmental Impact Report (DEIR). The RWQCB2 sent its three comments via email on July 31, 2009.

District Response to Regional Water Quality Control Board

RWQCB2 -RD1: The District notes that the Regional Board concurs with the revised evaluation of impacts presented in the recirculated Section 3.2 of the DEIR and the District's plan to conduct sediment testing within the project site.

RWQCB2 -RD2: The District notes that the Regional Board concurs with the determination of water quality impacts as significant as presented in recirculated Section 3.2 of the DEIR. Studies and modeling indicate that the rate of sedimentation in Alviso Slough is currently 1 to 2 feet per year (see Engineer's Report, Appendix C). As a result, little offsite mobilization of sediments is expected. As stated in Mitigation Measures WQ-A and WQ-B, testing will be conducted to determine the extent and nature of contaminated sediment levels; the District will provide results to the RWQCB to ensure that any permit conditions a met and beneficial uses are protected.

RWQCB2 -RD3: The armored notch at Pond A8 will provide a muted tidal connection through the perimeter levee that separates Pond A8 and upper Alviso Slough. The 40-foot-wide notch will consist of multiple bays that can be opened and closed independently to allow tidal exchange to be adjusted based on monitoring data. Initially, the notch would be operated with only one bay open. Additional bays could be opened if monitoring data confirm that slough widening does not threaten downstream levees, in particular the levees along the east side of Alviso Slough. If monitoring data indicate that DO levels are adversely affected, the notch can be operated to control water levels in the pond to improve DO conditions.

This page intentionally left blank.

2. Regional, Counties, Cities

- Santa Clara County Parks and Recreation Department

This page intentionally left blank.

SCPRD3-RD

County of Santa Clara
Parks and Recreation Department
298 Garden Hill Drive
Los Gatos, California 95032-7669
(408) 355-2200 FAX 355-2290
Reservations (408) 355-2201
www.parkhere.org

July 21, 2009

Michael F. Coleman, AICP
Project Manager/Environmental Planner
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

SUBJECT: Comments to the Re-circulated Draft Environmental Impact Report (RDEIR) for the Alviso Slough Restoration Project – SCH#20070882071

Dear Mr. Coleman,

The Santa Clara County Parks and Recreation Department (County Parks) has reviewed the RDEIR for the Alviso Slough Restoration Project (Project). It is understood that the purpose of the Project is to evaluate a range of alternatives for vegetation removal and dredging in Alviso Slough to meet a number of objectives, including restoration of Alviso Slough's channel navigation, recreational boating access, and integration of the District's restoration actions with the South Bay Salt Pond (SBSP) restoration project for Pond 8A. While it is understood that the RDEIR deals with an expanded analysis of impacts to water and sediment quality, it is also understood from the State Clearinghouse description of the project that the District staff has revised their 2008 recommendation for the preferred alternative from Alternative No. 5 to Alternative No. 3 as it has substantially less impact to the environment. SCPRD3-RD-1

Compatibility of Project Alternatives with the approved Alviso Marina County Park Master Plan and Construction of the Alviso Boat Launch Facilities

As stated in our 2007 response to the Notice of Preparation for the DEIR, our responsibility is to determine if the alternatives identified for the Project are compatible with recreational facilities identified in the approved 1997 Alviso Marina County Park Master Plan. This includes compatibility between the Project and the construction of the new Alviso Marina County Park Boat Launch Facility. In our response of the DEIR in August 2008, we determined that Alternative No. 4 or No. 5 were the alternatives most likely to be compatible with the County's plans to construct and operate a boat launch downstream from the Project area. SCPRD3-RD-2

While the project extent of Alternative No.3 is considerably less than No. 4 or No. 5, Alternative No. 3 is still considered compatible with the operation of the proposed Alviso Marina County Park Boat Launch Facility, as it is designed. However, as stated in the Project's 2008 DEIR,

Board of Supervisors: Donald F. Gage, George Shirakawa, Dave Cortese, Ken Yeager, Liz Kniss
Acting County Executive: Gary A. Graves

Alternative No. 3 will require ongoing maintenance dredging to offset sedimentation rates of up to 1 to 2 feet per year within its footprint. Therefore, it is important for the long-term compliance to project objectives and operation of the Boat Launch that the anticipated maintenance dredging identified for Alternative No. 3 is adopted as part of the Project and conducted on a routine basis.

Since August 2008, County Parks has completed development of design drawings and specifications for the proposed Alviso County Park Boat Launch, conducted an updated analysis of any potential impacts as a result of implementation of the Alviso Marina County Park Master Plan, filed an addendum to the 1997 FEIR for the Alviso Marina County Park, applied for the necessary regulatory agency permits for construction of the Boat Launch, and submitted copies of the plans to the Water District for needed encroachment permits. For additional information regarding the status of the Alviso Marina County Park Boat Launch, please contact Mark Frederick, Capital Programs Manager, at mark.frederick@prk.sccgov.org or at (408) 355-2210.

SCPRD3-RD-2

Thank you for the opportunity to review the RDEIR for the Alviso Slough Restoration Project. If you have any questions, please contact me at elish.ryan@prk.sccgov.org or by phone at (408)355-2236.

Sincerely,

Elish Ryan
Planner III

Cc: Julie Mark, Deputy Director
Jane Mark, Senior Planner
Mark Frederick, Capital Projects Program Manager
EIR Tracking File No. 261

Board of Supervisors: Donald F. Gage, George Shirakawa, Dave Cortese, Ken Yeager, Liz Kniss
Acting County Executive: Gary A. Graves

County of Santa Clara Parks and Recreation Department

Below are specific responses to the County of Santa Clara Parks and Recreation Department comment letter, dated July 30, 2009, concerning the Recirculated Section 3.2 of the Alviso Slough Restoration Project DEIR. The County of Santa Clara Parks and Recreation Department (SCPRD3) submitted two comments.

District Response to County of Santa Clara Parks and Recreation Department

SCPRD3 -RD1: The project objectives summarized by the commenter are consistent with those described in Section 1.2.3, Project Objectives and Alternatives, of the DEIR.

SCPRD3 -RD2: The District acknowledges the Santa Clara County Parks and Recreation Department comment that Alternatives 3, 4 and 5 would be compatible with the operation of the proposed Alviso Marina County Park Boat Launch Facility as long as maintenance dredging is conducted on a routine basis. As described in Section 2.4 of the EIR, the 10-year maintenance cycle maintenance requirements of each alternative are described and would provide to maintain navigational benefits.

The District appreciates the summary provided of County Parks' progress on the proposed Alviso County Park Boat Launch project as well as the contact information.

This page intentionally left blank.

3. Organizations and Individuals

- Citizens Committee to Complete the Refuge
- Libby Lucas, Conservation, CNPS, Santa Clara Valley Chapter – [Note: these comments were received after the comment period closed, therefore, the letter is incorporated but no response was prepared.]

This page intentionally left blank.

CCCR2-RD

CITIZENS COMMITTEE TO COMPLETE THE REFUGE

453 Tennessee Lane, Palo Alto, CA 94306 Tel 650 493-5540 Fax 650 494-7640 www.CCCRRefuge.org

July 30, 2009

Michael F. Coleman
Environmental Planner
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118-3686

RE: Alviso Slough Restoration Project

Dear Mr. Coleman:

The Citizens Committee to Complete the Refuge greatly appreciates this opportunity to comment on the recirculated Section 3.2 of the Draft Environmental Impact Report (DEIR) of the Alviso Slough Restoration Project (ASRP). Just a year ago, we submitted a comment letter on the entire DEIR. Issues we raised then continue to be of concern. In this letter our comments supplement that earlier letter, particularly as regards the changed content of the recirculated document. Regarding regional landscape we raise an issue that has not been previously addressed.

Once again, we submit these comments in the interest of the best environmental outcomes for our Bay's wetlands, its wildlife and for the Don Edwards San Francisco Bay National Wildlife Refuge. CCCR2-RD-1

Overall, our review of the revised document strengthens our earlier position regarding choice of alternatives. We very strongly recommend that the Santa Clara Valley Water District certify Alternative 6, No Project, as the preferred alternative in its Final Environmental Impact Report (FEIR). We find that the recirculated materials more clearly demonstrate that there is a substantial environmental and regulatory basis for that decision.

1. Mercury and Contaminant Mitigation

We were pleased to see that the document now defines Impact WQ-3 as having "the potential to increase net methylmercury production and bioaccumulation in the food web" and is "a significant impact that *cannot be mitigated*." (italics added) We heartily agree with this conclusion and believe it is a decision linchpin. CCCR2-RD-2

With that finding, the new Impact WQ-2 conclusion is moot. It considers "the potential to mobilize, transport and deposit of mercury-contaminated sediments"... as "a significant impact that *can be mitigated*." (italics added) This mitigation conclusion cannot be applied in the ASRP if there is no known method to mitigate a potential of methylmercury impact on the food web, if there is no way to assure that there will be no new dispersion of reactive mercury, if there is no way to assure that more mercury will convert to reactive form by sediment disturbance, and if there no way to predict the duration of impact produced by disturbance episodes. There can be no level of tolerance for mobilization, transport or deposit of any mercury-contaminated sediments using any form of mitigation. CCCR2-RD-3

The bottom line is that the historical fall-out of the Almaden Quicksilver Mine has created a singularly-significant environmental obstacle for any Alviso Slough project that disturbs sediment, particularly if the project is not purposed toward resolution of the problem. With time, the Guadalupe River TMDL and other actions may have the desired effect of changing that status but, for this project, mercury contamination is undeniably the show stopper. CCCR2-RD-3

It would be an oversight if we did not also recognize, as discussed in the new Section 3.2, that PCBs, organochlorine pesticides and other contaminants in sediment and water also pose various levels and types of threats. We expect the FEIR will present these issues fully, as they too put the entire project in a questionable light, particularly as additive threats whenever, in combination, the contaminants represent a biological assault by multiple factors. CCCR2-RD-4

We note that the DEIR makes no attempt to track the combined contaminant threat to any particular species though it does provide individual species tissue data as relates to each singular contaminant. A thorough reader will note that certain fish species are thus shown to be affected by multiple contaminants. If that is so then the cumulative contaminant threat posed to any particular species is a planning oversight and omission. Do contaminants work synergistically? Does one contaminant predispose a species to greater impact by a second contaminant? The FEIR must include scientific assessment of combined contaminant effect to individual species. CCCR2-RD-5

We note also that a "No Project" decision avoids all contaminant threats. Giving Impact WQ-3 the decision-making priority is justifiable and would direct a "No Project" decision. CCCR2-RD-6

2. Landscape Considerations

In our letter a year ago, we raised the concern that the ASRP DEIR had not included known decisions of the South Bay Salt Pond Restoration Project (SBSPRP). We are pleased to see an apparent shift in the recirculated Section 3.2 regarding the SBSPRP and hope that we will see that change throughout the FEIR. CCCR2-RD-7

Some months after our comment letter of last year, we learned that the Santa Clara County Parks and Recreation Department planned to begin pile driving and dredging in 2009 in Alviso Slough. This action would implement that agency's Project, the Alviso Marina County Park Boat Launching Facility (Marina Project). The project is the outcome of a FEIR certified in 1997.

Maps of the ASRP DEIR place the Marina Project's location within or adjacent to Alternatives 2-5 action. Alternative 1 action lies upstream but within a sphere of influence. The Marina Project would also disturb and remove sediments and is currently seeking permits to dredge to a depth of 11 feet, to remove 2000 cubic feet of sediment initially, to remove 5000 cubic feet of sediment during 10 years of maintenance and to remove marsh vegetation. CCCR2-RD-8

In the years since 1997, there have been many regulatory actions, land management changes and scientific studies that were not in effect, known or anticipated when the Marina Project was certified. Indeed those topics are represented in considerable detail in the ASRP DEIR. But the Marina Project is not discussed. It appears that the Marina Project and the ASRP are being pursued in isolation, ignoring environmental issues related to the undeniable, adjoining and shared terrain of Alviso Slough.

That raises a new question: For the ASRP, what would be the cumulative contaminant impacts for all Alviso Slough sediment disturbance when considered as a combination with actions of the Marina Project?

The ASRP FEIR must analyze conditions produced by the Marina Project and include those assessments in its impact and mitigation discussions, particularly as it involves contaminated sediment and water and cumulative habitat disruption.

CCCR2-RD-8

3. Project Objectives and Classification

With the release of the recirculated section of the DEIR, we noticed a change in the associated Notice of Completion and Environmental Document Transmittal filed with the State. In 2008 that form described the local action type as "Other: Alviso Slough." In the filing this year for the recirculated section, that entry was changed to add: "Historic restoration-not biological restoration."

The new detail implies that the project's goals are to serve human social interests. The full DEIR, in its first listed project objective, states: "Restore Alviso Slough's channel width, and habitat to prior to 1983 conditions." Thus it appears the "historic" objective is to serve social interests of a period less than 30 years ago. While certainly that period can be described as in the past, we are puzzled about how it can be called historic. If a 30-year-old building is leveled and replaced with a new building on the same site, it is called redevelopment. Would it be more precise to describe the ASRP as redevelopment? The DEIR discussion of purpose is inadequate. The FEIR must not be.

CCCR2-RD-9

In summary, we believe that issues discussed herein must be analyzed for the FEIR. The document must include a full assessment of the combined effects of cumulative contaminants on individual species. It should recognize Impact WQ-3 as the decision priority. It must analyze the impact of the combined slough disturbance of the ASRP and Marina Projects. It will need to explain, in its narrative, the precise purpose of the project overall. If all of that is done, we are quite certain that the FEIR will have to recommend Alternative 6, No Project.

Today we live in a nation that has shifted its course, recognizing humanity's dependence on the health of the intimate, interconnected, natural world. It is no longer about any one species, but about all. For this project, in a locality filled with the promise and premise of the largest wetland restoration on the west coast and the largest urban National Wildlife Refuge in the country, we have an opportunity to make the best of it all by respecting the natural and scientific values that are our guides for an environmentally healthy future. The right action is Alternative 6, No Project.

CCCR2-RD-10

Yours truly,

Carin High

Eileen P. McLaughlin
Shoreline Watch for San Jose

Carin High
Vice-Chairperson, CCCR

CC: Regional Water Quality Control Board
Don Edwards San Francisco Bay National Wildlife Refuge
US FWS Ecological Services Division
Santa Clara Valley Audubon Society
California Native Plant Society

This page intentionally left blank.

Citizens Committee to Complete the Refuge

The following are responses to the Citizens Committee to Complete the Refuge letter dated July 30, 2009, submitting ten comments concerning the Recirculated Section 3.2 of the Alviso Slough Restoration Project DEIR.

District Response to Citizens Committee to Complete the Refuge

CCCR2 -RD1: The District notes the Committee's recommendation that the No Project Alternative (No. 6) be identified as the preferred alternative. The District Board will consider this comment prior to making a decision regarding the ASRP.

CCCR2 -RD2: The District notes the Committee's concurrence with the revised impact analysis of the significance of the project's potential to result in a net increase in methylmercury production (Impact WQ-3).

CCCR2 -RD3: The District has changed its conclusion for Impact WQ-3, to significant and unavoidable, based on the uncertainty of the possible effects of a net increase of methylmercury on beneficial uses of the project area and South Bay, particularly given action levels set by the South Bay Mercury TMDL process. However, the levels of methylmercury available for bio-accumulation cannot be directly correlated to the amount of sediment mobilized in the system. Rather there are a number of conditions and complex interactions that drive the production of methylmercury. For this reason, the analysis regarding sediment entrainment and transport (Impact WQ-2) is separated from the impacts related to bioaccumulation (Impact WQ-3). Standard recognized practices are available to minimize sediment erosion and transport are known to be effective therefore, while sediment has the potential to temporarily cause significant impacts to water quality, effective mitigation measures are available to render such impact to a level that is less than significant.

The District acknowledges the comment regarding the advisability of pursuing any activities in the Guadalupe River system due to the presence of legacy pollutants, and respectfully disagrees that the issue is one that prevents implementation of reasonable solutions to manage or improve the system.

CCCR2 -RD4: As with mercury, the potential for PCBs and organo-chlorine pesticides attached to sediment particles to be mobilized can be mitigated through measures that minimize the temporary effects of the vegetation removal and dredging (Impact WQ-4) in recirculated Section 3.2. This impact is considered significant but can be mitigated to a level that is less than significant with the implementation of Mitigation Measures WQ-A and WQ-B would reduce the impact.

The District acknowledges the comment regarding the advisability of pursuing any activities in the Guadalupe River system due to the presence of legacy pollutants, and respectfully disagrees that the issue is one that prevents implementation of reasonable solutions to manage or improve the system.

CCCR2-RD5: The Draft EIR discusses the bioaccumulation of the toxic pollutants of concern – mercury, PCBs, and legacy organo-chlorine pesticides – related to the possibility that project activities may expose and remobilize deposits of contaminated sediments (pp. 3.2-4 through 3.2-8, pp. B-11 in Appendix B; see also Section 3.3, Biological Resources – Aquatic). Several impacts are identified, i.e., Impact WQ-3 (potential to increase methylmercury production and bioaccumulation in the food web), Impact WQ-4 (potential to mobilize, transport, and deposit PCBs and organochlorine pesticides), Impact AQBIO-2 (release and exposure of construction-related contaminants), and Impact AQBIO-3 (construction-related release and exposure of legacy contaminants in sediments) to address the potential release of contaminants. Mitigation Measure WQ-A provides the first means for measuring and monitoring contaminant concentrations in sediments, determining impacts to water and sediment quality and the need for any further mitigation measures. This is also acknowledged by the Regional Water Quality Control Board in their comment on Recirculated Section 3.2 (RWQCB2-1). Additionally, Mitigation Measure WQ-B would require the implementation of dredging methods that minimize dispersion of suspended sediments, which would reduce potential exposure of contaminants to species.

Thus, while the District notes that the combined contaminant threat to any species may be an issue, the proposed sampling and analysis of sediments (in Mitigation Measure WQ-A) is intended as an adaptive management approach. There are little quantitative data upon which to determine significance criteria or impacts for synergistic interactions with contaminants on species in the natural environment. While individual and multiple contaminants may affect individual species, the conditions where these potential effects are realized are extremely uncertain and speculative. Therefore, consistent with CEQA Guidelines Section 15151, a reasonable and feasible discussion is presented in the Final EIR to allow the District Board to consider the environmental consequences of approving the project.

CCCR2-RD6: The District acknowledges the comment regarding the advisability of pursuing any activities in the Guadalupe River system. However, the No Project Alternative does not have to be preferred because the project would have significant environmental impacts. The District Board will consider the benefits of the project against these potential significant environmental impacts before deciding to approve the project.

CCCR2-RD7: Comment noted.

CCCR2-RD8: As stated in the Santa Clara County Parks and Recreation Department comment letter dated July 21, 2009, the proposed Project (Alternative 3) would be compatible with the operation of the proposed Alviso Marina County Park Boat Launch Facility as long as maintenance dredging is conducted on a routine basis.

The Alviso Marina County Park Final EIR (1997) [Page 5-17] identifies a significant adverse impact on water quality as a result of construction dredging for the proposed marina. The mitigation measures identified to reduce this impact to a less-than-significant level include limiting construction and maintenance dredging to non-migratory season for steelhead (April 15 to October 15); employing a coffer dam, and suction dredging and desilting ponds during construction and maintenance. These measures are similar to those proposed by the District. Since the water quality impacts of both the Marina Project and ASRP are temporary and would be mitigated to less-than-significant levels, the combined impact of these two projects is not considered cumulatively considerable.

CCCR2-RD9: The commenter is correct in noting that the project would serve human interests; an important purpose of the Project is to restore the uses and configuration of the slough to near pre-1983 conditions so as to enhance navigation, water and land-based recreation in and around the slough (see EIR, Section 1.2.3). The year 1983 was selected based on:

(a) long time residents of Alviso confirm this year to be one of the last years in memory when navigation, recreation, and aesthetics were not significantly diminished by an abundance of sediment and vegetation, and

(b) the availability of data on channel conditions in the slough.

'Historic' is used as an adjective it is not intended to denote a specific standard, as is used under the National Historic Preservation Act. The term is used solely to clarify that the navigation restoration is set as a goal for the project that uses the 1983 condition.

CCCR2-10: Comment noted. Please see Responses CCCR2-1, CCCR2-5, CCCR2-6, CCCR2-8, and CCCR2-9, above.

This page intentionally left blank.

From: JLucas1099@aol.com [mailto:JLucas1099@aol.com]
Sent: Tuesday, September 08, 2009 10:06 AM
To: Mike Coleman
Subject: Alviso Slough Restoration Project - Amended DEIR

Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

Dear Michael Coleman,

In regards the revised Water and Sediment Quality Section of the Draft EIR for the Alviso Slough Restoration Project I would like to express my continued concern that preservation of viable marsh and upland vegetation in this upper segment of Alviso Slough be made a top priority.

As believe I submitted earlier, there need to be vegetated floodplain terraces retained just outboard of levees of this wider portion of downstream Guadalupe River, not only to buffer the levees but to provide a vegetated wildlife corridor around this critical portion of South Bay wetlands.

The recent San Francisquito Creek flood control project incorporates similar riverine floodplain terraces, outboard of levees, so this is an accepted US COE design for rivers as they interface with San Francisco Bay's estuarine system.

Also, the old Steamboat Slough confluence just downstream on Guadalupe River where Santa Clara County Parks is proposing to site their marina parking area, is a natural prototype of such a floodplain terrace with upland vegetation that transitions into healthy marsh. I will forward my letter to Paula Gill of US COE on this associated project with which I believe you should coordinate, to be in compliance with CEQA Guidelines.

In consideration of the Regulatory Agency concern with mercury laden sediments in Guadalupe Slough and neighboring salt pond A-8, would it be feasible to place fresh sediments on newly formed floodplain terraces to create uncontaminated wetlands to encircle this dredged Alviso Slough project area? These sediments could come from routine stream maintenance of neighboring watershed streams free of mercury loadings.

I do wish to reiterate that fringes of marsh wetlands on floodplain terraces outboard of flood control levees are essential for continuity of wildlife corridors around south end of San Francisco Bay for endangered species, highly beneficial to filter pollutants and sediments from levee and roadway runoff that degrade water quality, basic to the critical ecotone interface with uplands as described in Habitat Goals of San Francisco Estuary and would provide buffer for levees in high water storm events and in gradual progression of bay levels' rise.

Thank you for any consideration that you can give to these belated comments. Am afraid the prioroty mailed version of this Amended DEIR was not to be found in our CNPS office, so appreciate copy left at reception.

Libby Lucas,

Conservation, CNPS Santa Clara Valley Chapter
174 Yerba Santa Ave.,
Los Altos, CA 94022

This page intentionally left blank.

Section 2 June 2008 DEIR Comments and Responses

Comments are organized by federal agencies; state agencies; regional, county, and city agencies, and organizations and individuals. Each comment is alpha-numerically coded in the margin of the comment letter, based on the initials assigned for each comment letter in the order of the comments (see List of Commenters, above). For example, the first comment in the letter from the U.S. Fish and Wildlife Service (USFWS) is USFWS-1.

Where a public comment produced an associated change to the text of the Draft EIR, the response provides a reference to the modified section and pages(s) in the Final EIR.

Master Responses were prepared to address similar comments regarding the June 2008 DEIR were raised by resource agencies (UFWS, CDFG, and RWQCB) and others.

A. MASTER RESPONSES

Master Response 1: Construction Windows

This Master Response addresses the following comments: USFWS-1, DFG-4, DFG-5, DFG-28, DFG-36, RWQCB-12, and SCVAS-8.

Several comments focused on the construction schedule constraints posed by various aquatic and wildlife species with the potential to occur at the project site. CDFG commented that, "with minimal overlap of these two differently proposed work windows…CDFG requests that the District describe how they proposed to resolve these conflicting work windows." Work for the project would be divided into two phases; the first phase is vegetation removal which would primarily affect terrestrial wildlife species; the second phase is dredging and sediment/root mass removal in the slough and may affect aquatic wildlife species. The District has prepared a **Table of Likely Work Windows for Sensitive Wildlife Species (TERRBIO) and for Sensitive Fish Species (AQBIO)** to compare the schedule constraints for the different species and demonstrate the windows that would avoid disturbance impacts. This Table has been added to the FEIR in the Biological Resources Sections 3.3 and 3.4 as Table 3.3-5 and Table 3.4-6.

As indicated in the table below, the construction window would be very narrow any direct disturbance to the marsh, including vegetation removal, should occur first and take place after September 1st and before January15th. In-channel work that affects the aquatic ecosystem, such as dredging or root mass removal, would only occur June through November. Additional specific details for work windows would be indentified and implemented in consultation with NMFS, USFWS, and CDFG.

These construction windows were based upon information compiled by NMFS (through their Biological Opinion dated 14 January 2009 for the South Bay Salt Ponds (SBSP) Restoration Project) for aquatic wildlife species. The Draft EIR states that sensitive fish species are not present in the study area from June through September and institutes a work window of 15 June to 15 October; however, these dates are best estimates.

Likely Work Windows for Sensitive Wildlife Species and for Sensitive Fish Species†

Wildlife	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
TERRBIO-1 Construction-related loss of, or disturbance to, special-status species, marsh-associated wildlife (Also relevant for TERRBIO-2, TERRBIO-4 and TERRBIO-13)												
Migratory Bird Breeding Season	■	■	▨	▨	▨	▨	▨	▨	▨■	■	■	■
Raptor/Owl & Clapper Rail Breeding Season	■▨	▨	▨	▨	▨	▨	▨	▨	■	■	■	■
AQBIO-4 Construction-related habitat disturbance (Also relevant for AQBIO-5 and AQBIO-7)												
Steelhead and Chinook Salmon	▨	▨	▨	▨	▨	■	■	■	■	■	■	▨
Longfin Smelt††	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨

† This table illustrates standard in-water work windows for sensitive fish species based on permit conditions for the SBSP Pond A8 project (provided for steelhead). Actual in-water work windows for the proposed project are subject to request for change and would be developed in consultation with NMFS, USFWS, and CDFG.

†† Spawning generally occurs between November and June; however, fish could be present all year.

▨ Consultation required ■ General Work Window

The construction windows for terrestrial wildlife species shown in the table have gone through public review, have been permitted by all of the regulatory agencies, and have been approved by the USFWS Biological Opinion (issued 12 August 2008) for the Pond A8 Phase 1 action of the SBSP Restoration Project -- in the same locale as the proposed Alviso Slough project. Burrowing owls were not covered in the SBSP Biological Opinion. CDFG commented that, "depending on the species, nesting may begin as early as mid-January for owls and extend through mid-late August for other raptors." For this reason, the District has narrowed the construction window to mid-January for raptor/owl species.

Master Response 2: Mercury Contamination and Bioaccumulation Effects on Aquatic and Terrestrial Organisms

This Master Response addresses comments: DFG-14, DFG-15, DFG-17, RWQCB-15, BCDC-3, and CCCR-6.

The District acknowledges the potential for mercury-laden sediments to be more available as a result of project activities. AQBIO-3 and WQ-3 evaluate impacts of legacy contaminants, and TERRBIO-15 evaluates impacts of bioaccumulation.

Following the review of the CDFG and San Francisco Bay Regional Water Quality Control Board (RWQCB) comments on Draft EIR Section 3.2, Water and Sediment Quality, the section was revised and recirculated in June, 2009 to allow the public the opportunity to comment on the significant changes that were made. These changes shown here in the FEIR required new mitigation measures (WQ-A, WQ-B, and WQ-C) and in the instance of methylmercury bioaccumulation, the impacts were determined to not be fully mitigated with current technologies. A summary of revisions that were made in the recirculated Section 3.2 include:

- The potential to mobilize, transport, and deposit mercury-contaminated sediments (Impact WQ-2) is now considered a significant impact that can be mitigated to a level that is less than significant with the implementation of Mitigation Measures WQ-A, sampling of dredge spoils prior to disposal or reuse; and WQ-B use of hydraulic dredging (rather than mechanical dredging).
- The potential to increase net methylmercury production and bioaccumulation in the food web (Impact WQ-3) is now considered a significant impact that cannot be mitigated to a level that is less than significant, but may be minimized through coordination with the mercury reduction programs (WQ-C).
- The potential to mobilize, transport, and deposit PCBs and organo-chlorine pesticides (Impact WQ-4) is now considered a significant impact that can be mitigated to a level that is less than significant with the implementation of Mitigation Measures WQ-A, sampling of dredge spoils prior to disposal or reuse; and WQ-B, use of hydraulic dredging.

Master Response 3: Objectives of the Project

This Master Response addresses the following comments: DFG-37, NMFS-1, NMFS-2, RWQCB-1, RWQCB-2, RWQCB-16, RWQCB-17, RWQCB-18, RWQCB-19, RWQCB-20, and RWQCB-21.

Several commenters requested clarification on the purpose and need and the objectives of the project identified in the Public Draft EIR, in particular, commenters requested the reasoning for selecting pre-1983 conditions as the basis for restoring Alviso Slough's channel width.

The EIR, Section 1.2, Purpose and Need for Action, describes the Board's commitment to an "...enhanced quality of living in Santa Clara County through watershed stewardship and comprehensive management of water resources in a practical, cost-effective and environmentally sensitive manner," and outlines relevant policies intended to fulfill this mission.

The EIR also describes the Alviso community's concerns regarding past flood improvement projects on the Town, and its members' request to the District for "possible approaches to restore the historic uses of the Alviso Slough areas, particularly those lost due to the loss of the channel width and depth." This section further describes the actions the Board took to develop a project that would address these concerns. Thus, the purpose and need of the project is related to the District's commitment to address the concerns of the Alviso Community through implementation of its missions and policies.

The District worked with members of the Alviso community to define the project and formulate the objectives. In 2007, the District prepared a Problem Definition and Refined Objectives Report, which clarified the objectives of the Project used in the Draft EIR, as shown below.

Establishment of Project Objectives

Objectives	Reason for Objectives
Restore Alviso Slough's channel width, and habitat to prior to 1983 conditions	The reach of Alviso Slough downstream of the Gold Street Bridge has experienced a gradual decline in channel width and increasing encroachment from vegetation over many years. These conditions result from over a century of human activities such as groundwater over-pumping, the manipulation of the South Bay marshlands and drainage channels for agricultural and salt-making purposes, the realignment of channel meanders for more efficient flow conveyance, and urban development in the watershed. These anthropogenic influences, combined with natural processes attempting to achieve a level of equilibrium, have resulted in a reduced channel width and depth that precludes the community's ability to use the slough, as it once did, for navigational and recreational access. The community of Alviso advocated returning the slough to its pre-1983 conditions because this period is remembered by members of the Alviso community as a time when the width of the channel was sufficiently wide for navigation and recreation.
Improve the community's ability to pursue navigation, public access, and aesthetics to allow for the expansion of boating and other recreational and/or tourism opportunities	Please refer to the reason for objectives above.
Maintain one percent flood protection in Alviso Slough	The District implemented the one-percent flood protection measures in the Guadalupe River from I-280 to I-880 between 2002 and 2004. Although fluvial flooding was addressed by the project, the community continues to worry about flooding, as the Project area is subject to tidal flooding. The development of any project would need to maintain one percent flood protection to ensure that fluvial flooding of Alviso from a 100-year flood would be avoided. As such, this objective was formulated.
Reduce mosquito nuisance	Tidal marshes in the South Bay are not a major source of mosquito breeding habitat. However, the Alviso Water Task Force (AWTF) has noted that there is some degree of nuisance from mosquitoes that breed in open ditches that still exist within the community. To ensure that mosquito populations do not become a problem of the project, this objective was formulated.
Promote the integration of the Alviso Slough Restoration Project with the SBSP Restoration Project (including the SBSP Phase 1 Action at Pond A8) to re-establish the saltwater connection to the Lower Guadalupe River.	The SBSP Restoration Project is an ongoing restoration project that is located adjacent to the Alviso Slough Restoration Project. Any alternative developed for the Alviso Slough Restoration project would need to consider the expected lifecycle of SBSP Phase 1 actions and the timeframe for full tidal restoration of Pond A8 and other ponds adjacent to Alviso Slough. Restoration of Pond A8 to partially tidally-influenced conditions would contribute to the long-term goals and objectives of the SBSP Restoration Project, and perhaps to the long term goals of the restoration of Alviso Slough. Due to the scale of the SBSP Restoration Project, its proximity to the Alviso Slough Restoration Project, and the interconnection of the two projects, this objective was formulated.

Master Response 4: Lowering the Pond A8 Weir and Flood Management

This Master Response addresses the following comments: USFWS-4, USFWS-5 (focus on mercury), USFWS-6 (potential flooding issue), DFG-10, NMFS-3, CCCR-3, -5, and-7; LL1-8, and LL1-10.

Several comments questioned whether lowering the Pond A8 weir was a suitable mitigation measure for the proposed Project and expressed concern about potential increased flooding risks, increased frequency of overflows into Pond A8, and potential for transport of mercury pollutants and endangered species into Pond A8.

In the Final EIR, Sections 3.1 and 3.3 have been revised in to clarify the hydraulic baseline (2005) condition of flood management in the slough, the changes to the hydraulic baseline flood management that the proposed Project would cause, and the need to modify the Pond A8 weir to maintain the hydraulic baseline flood management condition. The following paragraphs summarize some key points of the flood management for the Lower Guadalupe/Alviso Slough area, and address some key concerns raised by several of the above-listed comments.

In the four years since the completion of the Lower Guadalupe River Flood Protection Project (LGRP), no overflows to Pond A8 have occurred. There is about a 10 percent chance in any winter season that the Guadalupe River flows from a storm event would be high enough to trigger an overflow, and only a very rare event (1.4 percent chance of occurrence in any winter season) would generate enough overflow volume to fill the Pond A5-A8 complex. (See Appendix III – Hydraulic Modeling and Analysis of Project Alternatives)

The proposed Alviso Slough Restoration Project would alter the channel geometry of only part of the slough – from the Gold Street Bridge to the County Marina. The proposed removal of vegetation and root mass and the dredging of slough sediments would increase the flow conveyance capacity in this 0.6-mile reach. The remaining two+ mile extent of the Alviso Slough channel between the County Marina and San Francisco Bay would not be modified by this project. This would create a situation wherein the increased capacity of an upstream reach of a waterway could induce flooding in the downstream reaches during very high flow events.

The proposed mitigation of lowering the Pond A8 weir addresses the proposed Project's potential to induce flooding in the downstream areas. The lowering of the weir would maintain the flood management condition at the hydraulic baseline (2005) level. Lowering the weir as part of the proposed project implementation would result in flood management and flood risks that are the same as the 2005 hydraulic baseline condition with no project in place.

Secondary impacts of the weir lowering

Potential increased flooding risks. The Alviso Slough channel geometry has changed since the 1999-2002 design and permitting of the LGRP. Cross-section surveys conducted in 2004 (SCVWD 2006) established a revised flood management condition that was used as the hydraulic baseline (2005) condition for analysis of the proposed Alviso Slough Restoration Project impacts. Comparison of the 2004 survey information with earlier surveys indicated that natural processes of sedimentation and vegetation encroachment in the slough had diminished its flow conveyance capacity between the Union Pacific Rail Road (UPRR) Bridge and San Francisco Bay. As explained in greater detail in Appendix IV, the reduced channel capacity changed the flood management operations for the LGRP with regards to overflows at the Pond A8 weir, but only for very extreme events.

When assessing the impacts of the proposed Alviso Slough Restoration Project to the flood management situation, the 2005 hydraulic baseline condition was used. As mentioned earlier, the mitigation measure of lowering the Pond A8 weir would serve to maintain the 2005 flood management conditions. Thus, there would be no more increased flooding risk than what exists in the proposed Project area today with no new project in place.

Increased frequency of overflows into Pond A8. Lowering of the Pond A8 weir would not increase the frequency of overflows into Pond A8. Please refer to Appendix III, Hydraulic Modeling and Analysis of Project Alternatives, for the detailed description of overflow frequency and volumes as established in the 2002 LGRP design and the overflow frequency and volumes based on the updated (2005) hydraulic baseline flood management condition.

Potential for transport of mercury pollutants. During the development and design of the LGRP, it was established that overflows to Pond A8 during very high flow events would transport suspended sediments to Pond A8, and that those suspended sediments could contain mercury. Whether the proposed Alviso Slough Restoration Project is implemented or not, the flood management condition for the LGRP would continue to carry the potential for transport of mercury to Pond A8 via weir overflows during extreme flow events.

Entrainment of endangered species. The Biological Opinion rendered as part of the LGRP permits acknowledged the possibility that fish species could be entrained in Pond A8 if overflows to the pond are triggered by extreme Guadalupe River flow events. As stated earlier, the proposed mitigation for lowering the weir as part of the Alviso Slough Restoration Project would retain the LGRP flood management condition at the 2005 hydraulic baseline condition. Thus, with or without the Alviso Slough Restoration project, the potential for endangered species entrainment in Pond A8 would be the same.

The anticipated 2009 installation of a notch to introduce a muted tidal regime in Pond A8 as part of the SBSP Phase 1 Actions, could improve the fate of endangered species that may be entrained in Pond A8 during a high flow event. The District plans to closely coordinate with USFWS in the latter's operation of the notch. Currently, USFWS plans to close the notch in the winter. If a high flow event were to occur, and Guadalupe River flows would overtop the Pond A8 weir, the notch could be opened after the storm event passes to speed up the draining of the pond complex. In such a case, if endangered species were entrained in the pond during the overflow event, they could make their way back to Alviso Slough via the opened notch. This could substantially reduce the potential mortality of entrained species during the rare events when overflows to Pond A8 would occur.

B. INDIVIDUAL COMMENTS AND RESPONSES

1. Federal Agencies

Comments from federal agencies and the responses to those comments are presented in this section.

- U.S. Fish and Wildlife Service
- National Marine Fisheries Service

This page intentionally left blank.

USFWS

United States Department of the Interior

FISH AND WILDLIFE SERVICE
San Francisco Bay National Wildlife Refuge Complex
9500 Thornton Avenue
Newark, California 94560

JUL 2 8 2008

Santa Clara Valley Water District
Attention: Mr. Michael F. Coleman, Environmental Planner
5750 Almaden Expressway
San Jose, CA 95118

SUBJECT: Comments regarding the Alviso Slough Restoration Project Draft Environmental Impact Report (DEIR)

Dear Mr. Coleman:

The Don Edwards San Francisco Bay National Wildlife Refuge (NWR) appreciates the opportunity to comment on the Alviso Slough Restoration Project DEIR. As a property owner near the project location, the NWR is concerned about the wildlife, habitat, and infrastructure impacts associated with this project. We would like to relay the comments below regarding the DEIR.

- *Noise, vibration and human disturbance to wildlife during construction.* We are concerned with the length of time required for construction activities of all the alternatives, especially Alternative 4 and 5. The first three alternatives also require a great deal of maintenance over time which will result in a large amount of cumulative disturbance to the area. The project area supports numerous migratory birds which rely on this habitat for breeding, nesting, foraging and roosting. We are concerned that construction and operation activities may displace these species temporarily and/or permanently from this area. Most wildlife species are especially sensitive to pile driving equipment which tends to result in high disturbance at longer distances. However, we are pleased to hear that construction activities will not occur during sensitive breeding and nesting periods for these species. We encourage the project to use technology and best management practices that reduce noise and disturbance to the project area. We would be happy to work with you on assessing the timing of the breeding season during the construction period. USFWS-1

- *Increased boat traffic.* There was insufficient information and analyses on boat traffic. With the renovation of the marina and increasing the Slough capacity to accommodate as many as two-lanes of traffic, we disagree that boat traffic will not increase above current levels. We could find no mention of the current existing boat traffic. Increased traffic in the area could disturb or flush birds and other wildlife from the area. Signage should be installed indicating the sensitivity of wildlife in the area. Signage or gates should also be installed to prevent boaters from entering the planned pilot channel to pond A8. USFWS-2

- *Habitat mitigation.* We suggest coordinating with the South Bay Salt Pond Restoration Project for potential mitigation areas in the South Bay. USFWS-3

- *Impacts to Refuge Infrastructure and Ponds.* We are concerned about the project's indirect impacts to refuge-managed ponds along Alviso Slough during flood events. Removal of marsh vegetation could result in levee erosion. The widening and deepening of the Slough by the project could have unanticipated consequences to lands and levees downstream of the Slough by forcing higher volumes of water down the remaining narrower portions of the Slough. Levees along the ponds could potentially overtop refuge levees causing flooding of the Alviso community. The combined effects of the planned A8 restoration project and this project should be thoroughly evaluated prior to construction. USFWS-4

- *Lowering of A8 Weir.* We do not support the lowering of the weir on A8 as increased flood waters spilling into pond A8 will cause increased contaminants levels, particularly in regard to mercury. USFWS-5 We are also not clear what property rights exist that allow the lowering of this weir and the increased flooding that would likely result. USFWS-6

Thank you for including our comments during your public comment period. We would like to discuss the potential flood impacts from this project to our properties. Because of the potential impact to migratory birds, we recommend that you coordinate with the Ecological Service Division of the Fish and Wildlife office. If you have questions for the Refuge, please contact Winnie Chan or myself at 510-792-0222.

Sincerely,

G. Mendel Stewart

G. Mendel Stewart

Manager, San Francisco Bay
National Wildlife Refuge Complex

Cc: Ryan Olah, USFWS

Response to U.S. Fish and Wildlife Service (USFWS)

USFWS-1: Please refer to Master Response 1, Construction Windows, for a discussion of how the construction timing relates to the critical periods for various sensitive species.

USFWS-2: The EIR does not provide information on the existing boat traffic using Alviso Slough. Field observations made between May and September 2006 concluded that boat traffic is small and limited to small water craft. This is likely due to the closed channel condition and currently limited access. However, plans are underway to complete a new boat launch ramp at the Alviso Marina County Park. The new facilities at the park would accommodate up to 26 vehicles with boat trailers, enabling individuals with trailered boats to access Alviso Slough and connecting Bay waters, thereby resulting in an increase of recreational boat traffic in the South Bay. Projections indicate there would be 3,836 uses of the marina each year, for an average of 10.5 used per day (Santa Clara County Parks, 2008) The EIR has been modified to include these projections in Section 4.2.2, (Cumulative Impacts – Biological Resources, Final EIR page 4-16).

The Draft EIR acknowledges that boat use would increase. Impact REC-2 (in Section 3.11, Recreation, of the Final EIR) specifies that the improvements to the slough in the Project area, coupled with installation of new docks at the South Bay Yacht Club (SBYC) could result in an increase in boating in Alviso – both for existing boat owners in Alviso and boats visiting SBYC, as well as smaller water craft like kayaks.

The EIR analyzes biological resources associated with boat traffic. The impact discussion for Alternative 4 of Impact TERRBIO-1 (in Section 3. 4, Biological Resources – Terrestrial) recognizes that boat traffic has been shown to impact wildlife use and it probably can be assumed that commercial, and recreational boats could reduce wildlife use, especially special-status wildlife use at these locations. However, as described in both impacts AQBIO-8 and TERRBIO-14 (in Section 3.3, Biological Resources – Aquatic and Section 3.4, Biological Resources – Terrestrial, respectively), the increase in boat usage is acknowledged.

In response to comments from the USFWS and CDFG, new analyses of boating impacts to wildlife have been inserted in Section 3.4.3 (Biological Resources – Terrestrial, Final EIR pages 3.4-43 and 3.4-44). Since the Project would remove sediment and marsh that currently restrict access to the existing SBYC boat, it is expected that approximately 34 boat slips would become active again. The increase in boat traffic from these boat slips is not expected to increase disturbance to wildlife to significant levels. However, since the Project would improve boating conditions in the Alviso Slough, and the Alviso Marina County Park is expected to install a new boat launch in 2009, the combined recreational boat use resulting from these two projects is expected to be cumulatively significant. County projections indicate there will be 3,836 uses of the marina each year, for an average of 10.5 used per day (Santa Clara County Parks, 2008). The highest use will generally occur on weekends, with peak use occurring on weekends during waterfowl hunting season. Therefore, informative signage regarding boat disturbance to wildlife would be installed (see Section 4.2.2).

USFWS-3: Comment noted. As one of the objectives of the Alviso Slough Restoration Project is to promote the integration of the Alviso Slough Restoration Project with the SBSP Restoration Project, the District has coordinated and would continue to coordinate with the SBSP Restoration Project team on potential mitigation areas in the South Bay.

USFWS-4: Please refer to Master Response 4.

USFWS-5: Comment noted. Please refer to Master Response 4.

USFWS-6: The District owns the A8 weir and adjacent lands in fee title. Please refer to Master Response 4 for further discussion of the potential for flooding associated with lowering of the weir.

NMFS

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
777 Sonoma Ave., Room 325
Santa Rosa, CA 95404-4731

August 15, 2008

In response refer to:
SWR/F/SWR3:GS

Michael F. Coleman
Environmental Planner
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, California 95118

Dear Mr. Coleman:

Thank you for the opportunity to comment on the Draft Environmental Impact Report (DEIR) for the Alviso Slough Restoration Project near the Town of Alviso (SCH #2007082071). The Santa Clara Valley Water District (SCVWD) is considering five alternatives that involve the removal of sediment and vegetation in Alviso Slough in order to restore the area to pre-1983 conditions. NOAA's National Marine Fisheries Service (NMFS) has reviewed the DEIR and offers the following comments regarding the project:

Project's Purpose and Need. Section 1.2 of the DEIR contains the project's "Purpose and Need for Action" and section 1.2.3 describes the project's five objectives. Project objectives #1 and #2 are to restore the channel of Alviso Slough to pre-1983 conditions and improve navigation, public access and aesthetics. The "need" for these objectives, including the basis for selecting pre-1983 conditions, should be presented in greater detail. The project's proposed removal of abandoned vessels, docks, and debris would improve navigation, and clearing of vegetation, root masses, and/or dredging around active docks and piers would enhance recreational opportunities. However, the "need" to improve navigation and recreation through an on-going program of large scale vegetation removal and dredging in the slough is not clearly described or adequately justified by the DEIR. NMFS-1

Regarding project objective #3, the SCVWD's Lower Guadalupe River Flood Protection Project (LGRP) has already established one-percent flood protection in Alviso Slough. Objective #4 is to reduce mosquito nuisance, but page 3.5-6 of the DEIR states "...mosquito nuisance is not considered do (sic) to be an issue at present...". Objective #5 pertains to integration with the South Bay Salt Ponds Restoration Project and this objective is primarily to achieve the benefits of Alviso Slough channel enlargement in a shorter term. NMFS-2

Mitigation Measure HYD-A: Lower Pond A8 Weir. To mitigate for changes to the hydraulics of the channel and potentially increased fluvial flood risk, the draft EIR proposes lowering of the NMFS-3 weir crest at Pond A8. This would constitute a modification to the LGRP and would require a reinitiation of the section 7 consultation between NMFS and the U.S. Army Corps of Engineers, related to the LGRP. NMFS issued a biological opinion to the Corps and SCVWD on April 17, 2003, which assessed the potential effects of the LGRP on threatened Central California Coast steelhead (*Oncorhynchus mykiss*). During flood events which overtop the weir, juvenile steelhead and salmon from the Guadalupe River can be carried into Pond A8. Within Pond A8, salmon and steelhead will likely perish since the levees around the pond complex do not provide free access for fish to return to Alviso Slough or San Francisco Bay. To avoid this potential impact to fish and avoid the requirement to reinitiate the section 7 consultation for the LGRP, NMFS recommends the increased fluvial flood risk be addressed by adjusting levee heights at an alternative location.

NMFS-3

If you have questions concerning these comments, please contact Mr. Gary Stern of my staff at 707-575-6060.

Sincerely,

Dick Butler
Santa Rosa Area Office Supervisor
Protected Resources Division

cc: Russ Strach, NMFS-Sacramento, California
Holly Costa, Corps-San Francisco, California
Luisa Valiela, EPA-San Francisco, California
Mike Thomas, FWS-Sacramento, California
Tami Schane, CDFG-Yountville, California
Margarete Beth, SFRWQCB-Oakland, California

Response to National Marine Fisheries Service (NMFS)

NMFS-1 & 2: Please refer to Master Response 3, Objectives and Need for the Project, for a discussion of the project's purpose and need and how each objective was formulated.

NMFS -3: Please refer to Master Response 4.

This page intentionally left blank.

2. State Agencies

Comments from state agencies and the responses to those comments are presented in this section.

- Senator Ellen M. Corbett
- California Department of Fish and Game
- California State Lands Commission
- California Department of Transportation
- San Francisco Bay Regional Water Quality Control Board
- State Clearinghouse
- San Francisco Bay Conservation and Development Commission

This page intentionally left blank.

EC

CAPITOL OFFICE
STATE CAPITOL
SACRAMENTO, CA 95814
(916) 651-4010
(916) 327-2433 FAX

DISTRICT OFFICE
1057 MACARTHUR BLVD., STE 206
SAN LEANDRO, CA 94577
(510) 577-2310
(510) 577-2308 FAX

(400) 286-0329 SAN JOSE
(510) 413-5960 FREMONT

Senate
California Legislature
ELLEN M. CORBETT
SENATOR
TENTH SENATE DISTRICT

STANDING COMMITTEES:
CHAIR, JUDICIARY
APPROPRIATIONS
BUSINESS, PROFESSIONS & ECONOMIC DEVELOPMENT
LEGISLATIVE ETHICS
TRANSPORTATION & HOUSING

SELECT COMMITTEES
CHAIR, BIOTECHNOLOGY
CHAIR, EARTHQUAKE & DISASTER PREPAREDNESS

July 18, 2008

The Honorable Rosemary Kamei, Chair
Board of Directors
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

Re: Alviso Slough Restoration Project

Dear Chairwoman Kamei:

Thank you and your distinguished colleagues on the Santa Clara Valley Water Board for your efforts on the Alviso Slough Restoration Project. You and your staff have shown great commitment to environmentally sound programs and projects district-wide. I am confident that the Alviso Slough Restoration Project and associated mitigation projects will be executed in a way that reflects this tradition of preserving natural resources and protecting our precious environment.

I write to formally submit my support for Project Alternative 5, as was expressed by a member of my staff at the July 16th public meeting.

Project Alternative 5 is the best option to optimally restore, and ensure the maintenance of, the Alviso Slough to its historic navigable width and depth. This would provide improved public access and recreational opportunities, improved fisheries, and economic stimulus to the community. Additionally, alternative 5 will most completely meet the project objectives, including integration with the South Bay Salt Pond Restoration Project, reduction of mosquito nuisance, and improved flood protection. EC-1

The Alviso community has suffered devastating losses due to repeated flooding in the past and many rightly fear future flooding if significant resources are not allocated to the Alviso Slough Restoration Project. I greatly appreciate your efforts to date in obtaining public comment and support for the project. I'm sure that you have been as touched as I by the emotional accounts of community members impacted by these flooding incidents. EC-2

Printed on Recycled Paper

This page intentionally left blank.

Response to Senator Ellen M. Corbett (EC)

EC-1: The District notes the commenter's support of Alternative 5. It should be noted that the objective of the project is to maintain flood protection, not improve flood protection. Fluvial flood risk would be maintained at one-percent flood protection.

EC-2: The District notes the commenter's opinion regarding obtaining public comment and support for the project. As described in Response EC-1 above, the project would maintain flood protection in the Alviso area.

This page intentionally left blank.

State of California – The Resources Agency ARNOLD SCHWARZENEGGER, Governor
DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
POST OFFICE BOX 47
YOUNTVILLE, CALIFORNIA 94599
(707) 944-5500

DFG

July 28, 2008

Mr. Michael F. Coleman
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

Dear Mr. Coleman:

Subject: Comments on the Draft Environmental Impact Report for Alviso Slough Restoration Project, SCH #2007082071, Santa Clara County

This letter is to inform you that the Department of Fish and Game (DFG) has reviewed the Santa Clara Valley Water District's (District) draft Environmental Impact Report (EIR) for the Alviso Slough Restoration Project (Project), SCH #2007082071. The Project site is located along the banks of Alviso Slough between the Gold Street Bridge and the Alviso County Marina in the lowest reach of the Guadalupe River. The Project includes a range of alternatives that include vegetation and root mass removal and, depending on the alterative, dredging of sediment. The Project may also include the removal of navigational hazards such as abandoned vessels, unused docks, and debris from the project area.

Pages ES-10, 1-9, and 3.4-2 – Streambed Alteration Agreement: The lists of permits and approvals the District will need to carry out this Project on pages ES-10 and 1-9 do not include a Lake and Streambed Alteration Agreement (LSAA). The text in Table 3.4-1 states that DFG does not claim jurisdiction over saltwater habitats including diked, muted, and salt or brackish tidal marsh, and that DFG will not require a streambed alteration agreement for this Project. DFG respectfully points out that this statement is incorrect, and that for any activity that will divert or obstruct the natural flow, or change the bed, channel, or bank (which may include associated riparian resources) of a river or stream, or use material from a streambed, DFG may require an LSAA, pursuant to Section 1600 et seq. of the Fish and Game Code. All of the action alternatives as described in the draft EIR would require an LSAA. DFG-1

Page ES-5 – Figure ES-1: The two photographs shown in Figure ES-1 on page ES-5 are oriented looking in the downstream direction, rather than upstream, as described in the caption. DFG-2

Page 2-4 – Deepening of Slough Bottom: The text on page 2-4 states that the removal of vegetation only (which would be under Alternatives 1 and 2) would result in a deepening of the slough bottom by up to one foot. However, Figure 2-1 shows that vegetation and root mass removal would lower the existing grade of the slough bottom by four feet, as DFG-3

Conserving California's Wildlife Since 1870 described for Alternatives 1 and 2 on pages 2-7 and 2-8, respectively. The District needs to resolve the ambiguity of this conflicting information provided in the document. DFG-3

Page 2-20 – Project Constraints: The draft EIR identifies the nesting season for migratory birds as spring and early summer. DFG respectfully points out that depending on the species, nesting in the Project area may begin as early as mid-January for owls and extend through mid-late August for other raptors. DFG-4

Pages 2-20, 3.3-21, and 3.4-23 – Construction Windows: On pages 2-20 and 3.3-21, the draft EIR identifies a work window of June 15 through October 15 to avoid construction-related impacts to various fish species. However, on page 3.4-23, the document identifies a work window from September 1 through February 28 to avoid impacts such as disturbance, injury, or mortality to terrestrial marsh species. With minimal overlap of these two differently proposed work windows, construction would be restricted to a very short duration between September 1 to October 15. DFG requests that the District describe how they propose to resolve these conflicting work windows while avoiding and minimizing impacts to both aquatic and terrestrial species, as some of the species identified as potentially impacted may be present in the Project area during any time of the year. The District must keep in mind that several of the terrestrial species identified as potentially present in the Project area are State fully protected species. Fully protected species may not be taken or possessed at any time and no licenses or permits may be issued for their "take" except for collecting these species for necessary scientific research, including efforts to recover fully protected, threatened, or endangered species. DFG-5

Page 2-24 – Construction Monitoring: The draft EIR indicates that biological monitors and District staff would be on site periodically during construction. Due to the abundance and sensitivity of special-status species potentially present in the Project area and the magnitude of the impacts associated with the proposed activities, DFG stresses the importance of vigilant biological monitoring for both aquatic and terrestrial resources, and expects biological monitors and District staff to be on site for the duration of construction. DFG-6

Pages 2-24, 3.3-18, 3.3-25, 3.4-31and 3.4-33 – Best Management Practices: The draft EIR repeatedly references the District's 2006 Best Management Practices (BMP) Handbook rather than listing required BMPs in the document. For purposes of public disclosure and to enable resource and regulatory agencies to appropriately assess potential impacts, the document should identify and describe each BMP pertaining to each activity that will be used to avoid and minimize impacts resulting from all aspects of this Project. DFG-7

Page 2-24 – Staging Site 10: Table 2-5 on page 2-24 identifies a potential staging area (Site 10) located adjacent to a small pond. DFG requests more information pertaining to the pond in terms of size, depth, presence of vegetation, salinity, wildlife use, and an assessment of what biological impacts, if any, may result from the use of the adjacent staging area. DFG-8

Page 2-25 – Staging site impacts: Figure 2-7 shows the locations of potential staging
areas. DFG requests more information pertaining to the potential presence of burrowing DFG-9
rodent holes that may provide habitat for burrowing owls (*Athene cunicularia*) and other
species that may use burrow holes as refugia, including amphibians.
Pages 3.1-15, 3.3-31, and 3.3-37 – Lowering of Pond A8 Weir: The draft EIR briefly
describes Mitigation Measure HYD-A as lowering the weir at Pond A8 to maintain the
existing flow split between Pond A8 and Alviso Slough, in order to maintain existing flows DFG-10
and levels of flood protection downstream of the Project site. The document does not
describe any of the methodology or construction-related impacts to any aquatic or terrestrial
species resulting from this activity. The District needs to fully describe how this activity
would be accomplished and develop and disclose measures to avoid and minimize impacts
to aquatic and terrestrial species. Since increased flows into Pond A8 could lead to
increased flows into other adjacent ponds and into Guadalupe Slough, the document also DFG-11
needs to clearly illustrate how these increased flows would not result in flooding and
scouring impacts to adjacent levees.

Page 3.2-18 – Turbidity Screen: The draft EIR states that a turbidity screen will be placed
around the vegetation removal and dredging areas to contain resuspended bottom material
and floating debris. DFG requests a more detailed description of this turbidity screen in DFG-12
terms of its size, how many and how long they are anticipated to be used at a given time,
and how they would be installed.

Page 3.2-19-3.2-23 –Suspension and Mobilization of Contaminated Sediment: The
draft EIR acknowledges that vegetation root mass removal and dredging would result in the
temporary suspension of sediments and that silt fences would be used to minimize DFG-13
disturbance. DFG requests additional information pertaining to these silt fences. How
many would be used at one time? How large are they? How would they be installed and
kept in place? How long would they be expected to be used?

The document states that the sediments are expected to settle quickly. DFG requests
further information describing the basis for this conclusion. What if sediments do not settle
as quickly as anticipated? How would the District mitigate the impacts of longer-term
turbidity? How would the District mitigate the impacts of longer-term suspension of
sediments potentially contaminated with mercury and other bioaccumulative pollutants?

DFG-14

The document acknowledges that dredging would expose potentially mercury-contaminated
deep sediments, but the District would not expect those sediments to be transported out of
the immediate Project area. DFG requests additional information as to how this conclusion
was drawn. DFG respectfully points out that even if those exposed sediments do not get
transported out of the immediate area, there may still be substantial impacts to aquatic
species present in the area, the bioaccumulation effects of which could be transferred up DFG-15
the food chain to terrestrial species.

The draft EIR also states that new sediments would be deposited, covering the deeper
sediments initially exposed. DFG requests additional information describing the expected DFG-16

Mr. Michael F. Coleman
July 28, 2008
Page 4

source of new sediment (from upstream or from tidal flows) and how long the District expects it to take for new sediment to adequately cover up the potentially contaminated sediment. DFG-16

Page 3.2-25 – Removal of Navigational Hazards: The draft EIR indicates that the District may remove navigational hazards, including abandoned vessels, unused docks, and old pier pilings in the Project area. The document states that a reasonable standard of care would be exercised to prevent the release of debris from these activities. DFG requests more detailed information describing how these activities would be conducted. DFG also requests further information regarding the expected impacts resulting from the suspension of sediments from these activities and how these impacts would be mitigated in terms of turbidity and exposure of potentially contaminated sediments. DFG-17

Page 3.3-17 – Chinook Salmon: The draft EIR states that fall-run Chinook salmon (*Oncorhynchus tshawytscha*) in the Guadalupe River are derived from hatchery stock and that the special-status designation does not apply. DFG respectfully points out that fall-run Chinook salmon are designated as a species of special concern by DFG, regardless of their origin, and that their status should be treated as such when assessing potential Project impacts and mitigation. DFG-18

Page 3.3-27 – Pile Driving: The draft EIR discusses the potential need for pile driving in the event that the District needs to replace any inadvertently damaged docks or piers. DFG requests more information pertaining to the type of piles the District may need to use in this Project. Specific information needed includes the size of the piles, the material that they would be made of, the expected depth they would be driven, and the approximate number of piles that the District anticipates to install. This information will provide a clearer understanding of potential impacts to aquatic species. DFG respectfully points out that pile driving impacts are not solely restricted to physical damage to fish such as hearing impairments, ruptured swim bladders, or internal bleeding. Sound pressure levels from pile driving may also have behavioral implications including but not limited to delays in upstream adult migration or smolt outmigration. DFG-19

Page 3.3-28-3.3-30 – Significant and Unavoidable Impacts to Fish Community: The draft EIR states that construction-related impacts to aquatic habitats will result in permanent loss or degradation of the macro-invertebrate community (due to reoccurring maintenance activities), and that this could result in substantial adverse effects to the fish community, including special-status species. The document identifies the affected fish community as including, but not limited to, the species of special concern Chinook salmon, the Federally threatened Central California Coast steelhead (*Oncorhynchus mykiss*), the Federally threatened green sturgeon (*Acipenser medirostris*), and the State candidate longfin smelt (*Spirinchus thaleichthys*). The document states that the permanent loss or degradation of the macro-invertebrate community would be a significant and unavoidable impact to the fish community under Alternatives 2-5 due to the size and magnitude of disturbance. DFG respectfully points out that the removal of 2.6 acres of vegetation and root mass in Alternative 1 may also be considered a significant impact to the fish community that relies on macro-invertebrates in the Project area as a food source. In addition, reduction or DFG-20 elimination of a food source could result in mortality or population declines of any or all of these fish species in the Project area.

The document does not adequately address how direct impacts to the fish community from the use of the Aquamog for vegetation and root mass removal and dredging will be avoided. The document refers to a construction work window possibly consisting of work during June through September, which may conflict with the work window associated with terrestrial species. DFG requests that the District provide additional measures describing how impacts to the fish community, including the permanent reduction or elimination of a food source and direct harm or mortality associated with the operation of large equipment such as the Aquamog in the wetted portion of Alviso Slough, may be mitigated below the level of significance. In order to obtain an incidental take permit for a State-listed or State candidate species, impacts must be fully mitigated below the level of significance. DFG-21

The document (Appendix C) acknowledges that longfin smelt may spawn in lower reaches of the Guadalupe River, which is just upstream of the Project site, and rear in brackish water, including Alviso Slough. Due to the close proximity of this species' potential spawning and rearing habitat to the Project site, it is reasonable to assume that this species may be present in Alviso Slough at any time of year. DFG respectfully points out that Project activities that would result in "take" of a State-listed or State candidate species (in this case, for longfin smelt) requires an incidental-take permit under State law. The document does not adequately describe how construction-related impacts to longfin smelt, which could be present in Alviso Slough at any time of year, will be avoided. DFG does not agree with the District's assessment that impacts to this species are less than significant, due the possible injury or mortality that may result from large dredging equipment such as the Aquamog. DFG-22

Page 3.3-29 – Macro-invertebrate Community Monitoring Report: The draft EIR states that Mitigation Measure AQBIO-B will require the District to evaluate and monitor the macro-invertebrate community and provide a bi-annual report to several resource agencies for a period of two years following initial construction. DFG respectfully points out that two years is a relatively short duration to evaluate the recovery of the macro-invertebrate community, particularly if there are unexpected non-Project related impacts higher in the watershed or atypical water years. DFG recommends that the District plan on providing a report to the resource agencies for a minimum of five years unless early reports consistently show a trend of full recovery. DFG-23

Page 3.3-34, 3.4-26, 3.4-27, 3.4-28, 3.4-29, 3.4-31, 3.4-38, 3.4-39 – Mitigation Measure TERRBIO-B: The document identifies impacts to freshwater marsh-dominated wetlands ranging between 2.6 acres of vegetation and root mass removal, up to 15.3 acres of vegetation and root mass removal (plus dredging of 9.7 acres of sediment to a depth of 10 feet for a total of 25 acres), depending on the alternative. The document describes these impacts as permanent as a result of the need to perform ongoing maintenance activities such as dredging and vegetation removal. The draft EIR identifies Mitigation Measure TERRBIO-B for the 2:1 replacement of tidal wetland habitat to offset impacts to DFG-24 wetlands and marsh-associated wildlife in the Project area under each of the five action alternatives. The document states that under each of the five action alternatives, impacts to wetlands and marsh-associated wildlife will be less than significant with implementation of Mitigation Measure TERRBIO-B and mitigation measures associated with construction timing to avoid breeding seasons. DFG disagrees with the District's assessment that removal of between 2.6 acres and 15.3 acres of wetland habitat is less than significant. Reduction of wetland habitat at this scale could substantially reduce the habitat marsh-associated species, substantially reduce the number of endangered, rare, or threatened species, or have substantial adverse effects to special-status species. In addition, repetitive maintenance activities will permanently reduce the quality of the habitat for wildlife use and repeatedly impact those species that do recolonize the disturbed habitat. DFG requests more information describing why the District feels a 2:1 replacement ratio is appropriate to reduce these Project impacts below the level of significance, considering the substantial amount of loss of wetlands that have occurred historically in San Francisco Bay and the substantial impacts that this Project would have on numerous special-status species that rely on presently existing marsh habitat. DFG-24

DFG respectfully points out that mitigation for the loss of any type of wetland must be mitigated in-kind, so if the Project site is dominated by freshwater marsh (as described in the document), then the type of wetland habitat created must also be dominated by freshwater marsh. The opportunities to implement large-scale tidal or freshwater wetland mitigation in the South Bay are rare, as most potential sites are already publicly-owned. The document has identified several possible sites for tidal wetland mitigation, assuming a ratio of 2:1. DFG requests that the District identify specific areas available and appropriate for in-kind wetland mitigation that would appropriately compensate (in both quality and quantity) for the wetland types which would be lost as a result of this Project. DFG-25

The draft EIR states that a monitoring plan will be developed and implies that this may be done for five years. It is unlikely that an in-kind mitigation project will have achieved all of the success criteria within a five-year time frame. DFG recommends that the District anticipate on a longer term mitigation and monitoring plan, such as a minimum of ten to fifteen years. DFG-26

Page 3.3-37 and 3.3-41 – Boat Use: The draft EIR states that the improved recreational access to Alviso Slough is not expected to substantially increase boat use or boat wake impacts on adjacent marshes and species that utilize the marshes. DFG questions this assumption, as one of the primary objectives of this Project is to improve the community's ability to pursue navigation and expansion of boating opportunities. The document describes the importance of increasing the recreating abilities of both local residents and tourists. It is reasonable to assume that with increased access, especially in the vicinity of the South Bay Yacht Club, the Blue Whale Sailing School, and a planned boat launch ramp at the Alviso Marina County Park, there may be a substantial increase in boating-related impacts to both aquatic and terrestrial species. DFG recommends that the District better define the potential impacts associated with anticipated increased boat use as a result of this Project. DFG-27

Pages 3.4-9 and 3.4-23 – Salt Marsh Wandering Shrew: Table 3.4-4 on page 3.4-19 states that the salt marsh wandering shrew (*Sorex vagrans halicoetes*) is not likely to occur in the study area, but that it is known to occur nearby. DFG recommends that the District develop measures addressing how impacts to this species will be avoided or minimized if it is encountered during Project construction. DFG-28

Pages 3.4-12 and 3.4-36 – Plant Surveys: The draft EIR states that the potential for special-status plants in the Project area was assessed in Summer 2004. It is not clear how detailed these surveys were (reconnaissance-level or other). The assessment for special-status plant species is now four years old. They will be six or seven years old if construction proceeds in 2010 or 2011 as described in the document. DFG recommends that the District describe the methodology and conduct updated surveys of the Project site for special-status plants to enable a more reliable assessment of potential impacts as a result of this Project. DFG-29

Pages 3.4-12 and 3.4-16 – Salt Marsh Harvest Mouse: Table 3.4-4 on page 3.4-16 states that there is a small possibility that the Federally endangered and State endangered and fully protected salt marsh harvest mouse (*Reithrodontomys raviventris*) could occur in alkali bulrush (*Scirpus robustus*) habitat in Alviso Slough. The document also mentions three known locations in the near vicinity of the Project area. Fully protected species may not be taken or possessed at any time and no licenses or permits may be issued for their "take" except for collecting these species for necessary scientific research, including efforts to recover fully protected, threatened, or endangered species. Trapping as a mitigation measure is considered "take" and is a violation of State law. The document does not address specific measures to prevent "take" of salt marsh harvest mice related to construction activities. Mitigation measures to ensure avoidance which does not cause "take" of this species must be developed and disclosed. DFG-30

Page 3.4-16 – California Black Rails: Table 3.4-4 on page 3.4-16 states that non-breeding individuals of California black rail (*Laterallus jamaicensis coturniculus*) are known to be present within the study area. The document does not otherwise mention this species in the rest of the document. The California black rail is a State threatened and fully protected species. Fully protected species may not be taken or possessed at any time and no licenses or permits may be issued for their "take" except for collecting these species for necessary scientific research, including efforts to recover fully protected, threatened, or endangered species. The document does not address specific measures to prevent "take" of California clapper rail related to construction activities. Mitigation measures to ensure avoidance which does not cause "take" of this species must be developed and disclosed. DFG-31

Page 3.4-17 – Bank Swallows: Table 3.4-4 on page 3.4-17 states that bank swallows (*Riparia riparia*) do not breed in the Bay Area. This is incorrect, as they are known to breed within the Golden Gate National Recreation Area at Fort Funston. DFG agrees with the District that they are unlikely to breed within the Project area. DFG-32

Page 3.4-21 and 3.4-22 – Assumptions for Threshold of Significance: The draft EIR states that direct impacts to wildlife species are assumed to be correlated with the loss of plant communities that provide their primary habitat. DFG questions this assumption, since some species, such as western snowy plovers (*Charadrius alexandrinus nivosus*), California least terns (*Sterna antillarum browni*), and American avocets (*Recurvirostra americana*), utilize sparsely or unvegetated scrapes for nesting or roosting. Activities which may impact these unvegetated nesting areas could be incorrectly characterized as insignificant by assessing significance based solely on the loss of plant communities. DFG-33

In addition, the draft EIR states that making significance determination on the basis of habitat loss or gain has been used instead of changes in the numbers of individuals to determine thresholds of significance. DFG respectfully points out that the California Environmental Quality Act Guidelines used for determining level of significance of impacts are not optional and that all of the guidelines must be considered. A significant impact would occur if a project were to substantially reduce the number or restrict the range of an endangered, rare, or threatened species.

Page 3.4-23 – California Clapper Rails: The draft EIR indicates that California clapper rail (*Rallus longirostris obsoletus*) have been observed in the vicinity of the Gold Street Bridge during the non-breeding season. This is a State and Federally endangered and fully protected species. Fully protected species may not be taken or possessed at any time and no licenses or permits may be issued for their "take" except for collecting these species for necessary scientific research, including efforts to recover fully protected, threatened, or endangered species. The document does not address specific measures to prevent "take" of the California clapper rail related to construction activities. Mitigation measures to ensure avoidance which does not cause "take" of this species must be developed and disclosed. DFG-34

Page 3.4-23 – Preconstruction Surveys: The draft EIR states that the District would conduct preconstruction surveys for salt marsh common yellowthroat (*Geothylpis trichas sinuosa*) and Alameda song sparrow (*Melospiza melodia pusillula*) prior to Project activities related to mowing of vegetation outside of the breeding season in advance of dredging activities. DFG assumes that the District will conduct appropriate preconstruction surveys for all terrestrial species potentially impacted by this Project. DFG-35

Page 3.4-32 and 3.4-33 – Impacts to Species in Pond A8: The draft EIR states that black-necked stilts (*Himantopus mexicanus*) and American avocets are known to nest adjacent to the Project site in Pond A8. DFG requests more information describing why the District feels that noise associated with Project-related construction would not be an impact to nesting black-necked stilts and American avocets, and why no mitigation measures are proposed for this species. DFG-36

General Comment: DFG recognizes that all of the action alternatives associated with this Project may have substantial impacts to a multitude of aquatic and terrestrial species and their habitats. Several of the affected species are fully protected species for which an incidental take permit cannot be issued. DFG questions whether the Project's goals and DFG-37 objectives outweigh the substantial impacts to water quality and biological resources, and the District's ability to adequately mitigate for those impacts. DFG strongly recommends that the District consider not certifying the document for this Project.

DFG-37

DFG appreciates the opportunity to comment on the District's draft EIR for the Alviso Slough Restoration Project. Questions regarding this letter and further coordination on this Project should be directed to Ms. Tami Schane, Environmental Scientist, at (415) 831-4640; or Mr. Greg Martinelli, Water Conservation Supervisor, at (707) 944-5570.

Sincerely,

Cindy Castellano

Charles Armor
Regional Manager
Bay Delta Region

cc: State Clearinghouse

Ms. Margarete Beth
Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

This page intentionally left blank.

Response to California Department of Fish and Game (DFG)

DFG-1:	Text in the Final EIR (Table 3.4-1, page 3.4-3) was revised to reflect that a Streambed Alteration Agreement (SAA) may be required for this project.
DFG-2:	The captions to Figure ES-1 on page ES-5 of the Final EIR have been corrected as noted.
DFG-3:	Figure 2-1 in Section 2.3.1 of the EIR shows that vegetation and root mass removal activity would extend to a depth of 4 feet so as to loosen most, if not all, of the root mass that extends into the sediment. Figure 2-1 does not indicate that the grade of the slough would be lowered by 4 feet as a result of this activity. As described on page 2-4 of the Final EIR, "Removal of the vegetation root material only (without dredging) would result in only a minimal (up to 1-foot) deepening of the slough bottom, which may vary depending on the location, extent of root mass, etc."
DFG-4 & 5:	Please refer to Master Response 1, Construction Windows, for a discussion of how the construction timing relates to the critical periods for various sensitive species.
DFG-6:	Comment noted. The specific level of monitoring would be determined through the permitting process and consultations with resource agencies.
DFG-7:	A list of the Best Management Practices (BMPs) relevant to the project is shown in the Final EIR Appendix II, Best Management Practices List. The Draft EIR referenced the District's Manual for Best Management Practices as the 2005 version. This manual has been updated and the 2008 version would be followed for this project, see also the MMRP Table.
DFG-8:	Staging Area 10 has been removed from Table 2-5 in the Final EIR. This site will not be considered further as a potential staging area for Project work.
DFG-9:	The staging sites were selected in areas that are already disturbed. Ground squirrel burrows are present in many of these locations. Pre-construction surveys would be required prior to final selection of the staging areas and project implementation. These measures are outlined in Section 3.4.5 as well as in Mitigation Measure TERRBIO-D.
DFG-10:	Impacts to aquatic and terrestrial species due to the construction of the weir at Pond A8 was presented and discussed in the Lower Guadalupe River Flood Protection Project Final EIR (LGRP, 2002). The impacts and mitigations are summarized below. Impacts due to lowering the weir, as proposed for the Alviso Slough Restoration Project, are unlikely to be greater than determined for LGRP as the work will be within the same footprint and only slightly greater in depth. Thus, impacts due to grading and hauling of dirt and mitigation would be the same as proposed for LGRP. 1. Potential loss of habitat for Special-Status Plant Species Congdon's tarplant has been known to occur in areas of Alviso. It is well adapted to a wide range of disturbed environments, from tidally influenced ditches to seasonally wet

agricultural fields where it is more common. Because this species is unlikely to occur in the impact area and adapts well in disturbed areas, the loss of small amounts of marsh or ruderal habitat from construction of an inlet weir was considered less-than-significant impact (for LGRP) and no mitigation required (LGRP FEIR, 2002, p. 3E-41).

2. Impact to Tidal Marsh Habitat
Construction of the weir is expected to permanently affect tidal marsh habitats along Alviso Slough (primarily brackish marsh), aquatic habitat of Pond A8W, a small amount of salt marsh and peripheral halophvtes along Pond A8W's perimeter, and ruderal habitat on the levees separating the 2 areas. Impacts on vegetation in these areas are considered significant because these habitat types are considered sensitive natural communities and are increasingly rare in the south bay region. The sensitive nature of these habitats, as well as their jurisdictional status, would require additional mitigation. To reduce the impacts on vegetation to a less-than significant level, the District committed to replacement or compensation for wetland habitat lost at a 1:1 ratio at the District's Pond A4 mitigation site (LGRP FEIR, 2002, p. 3E-43).

For the Alviso Slough Project, the District has also proposed Mitigation Measure TERRBIO-B: 2:1 replacement of tidal wetland habitat.

3. Impact: Potential for Impacts on Ruderal Habitats
Impacts on ruderal habitats could result from construction of the Alviso Slough overflow weir improvement of the levee around the town of Alviso, and vegetation management. The extent of these impacts, and temporary or permanent nature of the impacts, will not be known until a more specific design has been developed. The loss of ruderal habitat, whether permanent or temporary, is considered less than significant because ruderal habitats are common in the area. No mitigation is required (LGRP FEIR, 2002, p. 3E-44).

DFG-11: Mitigation Measure HYD-E (Section 3.1.3, page 3.1-19 in the Final EIR) has been modified to include inspection of levees along Guadalupe Slough after an extreme event that triggers an overflow from Alviso Slough to Pond A8 and the other adjoining ponds (A5 – A7) in that complex. This inspection would assess any damages or erosion to these levees as a result of the flood management practices in place.

DFG-12: The use of turbidity screens, or silt curtains, is a common practice during dredging activities to minimize impacts of turbidity and dispersal of sediments. Silt curtains are permeable or impermeable flexible barriers that hang down from the water surface to isolate the impacted area from the surrounding waters and allow suspended sediment to settle within the water column of the impacted area. The U.S. Army Corps of Engineers (USACE) has designated silt curtains as a best management practice during dredging operations and has published a Technical Note describing the design and application considerations when using such devices (ERDC TN-DOER-E21, Sept 2005). Silt curtains are also described in the USACE Technical Guidelines for Environmental Dredging of Contaminated Sediments, September 2008.

The District would determine further details regarding the design (size, material, permeable vs. impermeable, skirt length, etc), implementation (duration of deployment, fixed vs. movable, etc.), and verification (turbidity measurements, visual inspections) of silt curtains when the project alternative is selected. The District would utilize guidance issued by USACE and consult with manufacturers to determine the appropriate design for this project. Important considerations for developing design details of silt curtains for use in Alviso Slough include identifying current speeds within the Slough, sizing the curtains according to tidal water elevation changes to avoid dragging bottom and stirring up sediments, maintaining navigation within the slough (if necessary), and the feasibility of conducting work with amphibious vehicles within the confines of a silt curtain. All of these details would also be subject to review in the permitting phase.

DFG-13: Silt fences are similar to silt screens and turbidity screens. Please see DFG-12 above.

DFG-14 & 15: Please refer to Master Response 2, Mercury Contamination and Bioaccumulation Effects on Aquatic and Terrestrial Organisms.

DFG-16: In Section 3.1, Hydrology and Geomorphology, Sediment Dynamics, it is stated that sedimentation rates of 1.4 to 2.7 feet per year have been recorded in the slough. Based on this information, 1 to 2 inches of sediment from both upstream flows and tidal flows is expected to accrete in the slough every month after the project is completed.

DFG-17: Please refer to Master Response 2, Mercury Contamination and Bioaccumulation Effects on Aquatic and Terrestrial Organisms.

Impact WQ-2 (in Section 3.2, Water and Sediment Quality) addresses the project's potential to mobilize, transport, and deposit mercury-contaminated sediments; this impact would also apply to the removal of navigation hazards.

Impact WQ-7 addresses impacts from removal of navigational hazards. The level of care would be based on state laws, including the California Department of Boating and Waterways guidelines for abandoned boat removal, as stated in Section 2.3.3. The California Boating Law can be found at http://www.dbw.ca.gov/PDF/2008CBL.pdf.

With regard to removing vessels, the following is provided in Impact WQ-7 (Final EIR page 3.2-32): "In removing the abandoned vessels, qualified marine salvage operators should be competent to develop and implement spill containment plans to prevent water quality impacts. These plans would specify measures including assessment of onboard fuel and oil supplies, the presence of leaks and exposed engine parts, deployment of booms and skimmers, and other accepted practices to prevent discharge of gas and oil from boats as they are removed."

DFG-18: Text has been modified in Section 3.3.2 to reflect fall-run Chinook salmon as being designated as species of special concern by CDFG, regardless of their origin.

DFG-19: Details regarding the number and type of piles are not yet known. Impacts to aquatic species from pile driving are addressed in AQBIO-4, including behavioral avoidance or migration delays that could result from potential exposure of fish to underwater sound pressure. In response to this comment, changes have been made to the text of the EIR for purposes of further clarification (Final EIR page 3.3-28).

DFG-20: The AQBIO-4 impact conclusion for Alternative No. 1 is less than significant with mitigation because potential construction-related direct impacts to special-status fish species could be avoided and/or minimized with identification and implementation of construction work-windows in consultation with NMFS, CDFG, and USFWS; maintenance of minimum 20-foot marsh buffers along upland margins of Alviso Slough; and evaluation and monitoring of the macroinvertebrate community response to disturbance. If the monitoring results prove that the community (abundance and structure) has not fully responded after one year from completion of the initial vegetation removal and dredging activities, reoccurring vegetation removal and dredging would not proceed and the resource agencies would be notified. Investigation of the cause of the decline/lack of response would be conducted and additional corrections in construction operations would be made where applicable. Because of the increased size and magnitude of disturbance associated with Alternatives 2 through 5, the impact would be considered a Significant and Unavoidable after implementation of the mitigation measures.

DFG-21: Impact AQBIO-4 and Mitigation Measures AQBIO-A and AQBIO-B addresses impacts to fish that could result from use of the Aquamog. Please also refer to Master Response 1 for a discussion on construction windows.

DFG-22: Section 3.3.2 acknowledges that longfin smelt are a Candidate species for listing under the California Endangered Species Act (CESA). Impact AQBIO-4 and Mitigation Measures AQBIO-A and AQBIO-B addresses impacts to fish that could result from use of the Aquamog. Please also refer to Master Response 1 for a discussion on construction windows. The implementation of the Mitigation Measures is intended to avoid impacts to longfin smelt by maintaining buffers along the margins of Alviso Slough, and by evaluation and monitoring with cessation of vegetation removal and dredging if needed due to decline or lack of response in community structure and abundance.

DFG-23: The text has been modified in Mitigation Measure AQBIO-B to reflect a minimum monitoring period of 3 years and extended to 5 years if recovery does not meet goals (Final EIR pages 3.3-30 to 3.3-31).

DFG-24: The removal of wetland habitat under all alternatives is a significant impact, as described. Page 3.4-24 defines the categories of impacts, noting that "Class II" impacts are significant, but can be mitigated to a level that is less than significant" Mitigation Measures TERRBIO-A and TERRBIO-B in Section 3.4.3 (Biological Resources – Terrestrial) are implemented under each of the alternatives, and fully mitigate for the impacts.

DFG-25: We agree that opportunities to create tidal freshwater marsh habitat are rare in the South Bay, but we respectfully disagree that "in-kind" mitigation is required. Certainly, the habitat values of tidal marsh can only be replaced "in kind". However, the salinities of the water and soils of these sloughs change over time, as does the dominant vegetation. Encroachment first by brackish marshes, then by freshwater marshes, greatly diminished the habitat available for federally and state listed species (e.g., California clapper rail, salt marsh harvest mouse) as well as the suite of species found in the tidal salt marshes of the area. In fact the Department and other agencies have required mitigation for such encroachment to compensate for impacts of fresh-water discharges at nearby water pollution control plants. Given the loss of salt marsh habitat in South San Francisco Bay, restoration of tidal salt and brackish marshes has been proposed and accepted as mitigation in the recent past. A recent example is the Island Ponds Restoration Project, in which the District funded the restoration of Ponds A19, A20, and A21 as mitigation for their Stream Maintenance Program (SMP) and the LGRP. The District is examining potential mitigation that could include the use of Pond A4 (owned by District) or funding of SBSP restoration activities.

DFG-26: Restoration of tidal habitats, whether part of the mitigation programs of the SBSP Restoration Project or undertaken independently, has a very high chance of success in restoring marsh vegetation. When the site is selected, appropriate monitoring timelines would be established. We agree that in most subsided sites, a five year timeline is too short. That is why the success criteria were set for five years after the site reaches the tidal elevation appropriate for colonization by vegetation.

DFG-27: The Final EIR has been revised in response to comments from the USFWS and CDFG. Additional discussion of boating impacts to fish and wildlife has been inserted in Sections 3.4.3 (Biological Resources – Terrestrial – Impact TERRBIO-14 on pages 3.4-43 and 3.4-44) and 3.3.3 (Biological Resources – Aquatic Impact AQBIO-8 on page 3.3-40) of the Final EIR. Since the Project would remove sediment and marsh that currently restrict access to the existing SBYC boat, it is expected that approximately 34 boat slips would become active again. It is acknowledged that additional boat use has the potential to increase shoreline erosion resulting in the direct or indirect loss of marsh habitat along the edge of Alviso Slough, disturb wildlife including harbor seals in the South Bay, and increase turbidity in water bodies for several hours after boating ceases which could disrupt normal patterns of foraging, breeding, and migration for steelhead (Oncorhynchus mykiss) and other fish species. However, the increase in boat traffic from these boat slips is not expected to increase disturbance to wildlife to significant levels. However, because the Project would improve boating conditions in the Alviso Sough, and the Alviso Marina County Park is expected to install a new boat launch in 2009, the combined recreational boat use resulting from these two projects is expected to be cumulatively significant. Therefore, informative signage regarding boat disturbance to fish and wildlife would be installed to educate the public about impacts boat disturbance can have on wildlife, inform boat-users of ways to avoid flushing waterbirds, summarize federal Marine Mammal Protection Act, and outline NOAA Fisheries recommendations of disturbance-free buffers around harbor seals (see Section 4.2.2, Cumulative Impacts, Biological Resources).

DFG-28: The salt marsh wandering shrew is known from the general vicinity—with the closest record in New Chicago Marsh, two (2) miles from the site. There are no records from this part of Alviso Slough, or from brackish or freshwater marshes. As a species that is found typically in the upper margins of tidal salt marshes and in moist locations in diked salt marshes, there is no reason to suspect that it would be encountered in the Project area. TERRBIO-1 describes the general impacts to marsh-associated species, and mitigation measure TERRBIO-B describes replacement of tidal wetland habitat.

DFG-29: Protocol-level pre-construction surveys for special status plants were conducted in summer 2004. While protocol-level surveys for all special status plant species have not been conducted since 2004, H. T. Harvey & Associates has performed annual vegetation mapping of the Project area for the City of San Jose. None of the special status plant species in question were observed during this annual vegetation mapping. In addition, protocol-level surveys for Congdon's tarplant were conducted in all impact areas on 20 October 2008 by two qualified botanists. Protocol-level surveys are not being recommended prior to implementation of the project because no special status plant species were observed during surveys and it is unlikely that any populations of special-status plant species would germinate within the project impact areas before project implementation. Furthermore, suitable habitat is present only for Congdon's tarplant, which was excluded from the site during protocol-level surveys conducted on 15 October 2008. In addition, as stated in the EIR, should seed for Congdon's tarplant come into the Project area, it is unlikely that a large population would establish. Therefore, any impacts to this unlikely, small population would not be significant under CEQA. It is important to note, however, that should extensive time periods pass before project implementation, resource agency staff may require floristic, protocol-level surveys of the entire site (which would include several surveys) to confirm absence of all special status plant species and to develop a complete species list for the Project area.

DFG-30: The extent of distribution of Salt Marsh Harvest Mouse (SMHM) in alkali bulrush dominated brackish marshes is not known, as trapping is prohibited. Nonetheless, most of the habitat along the slough that would be disturbed is currently dominated by cattails and California bulrush (fresher marsh species). Still, some areas downstream of the Yacht Club and near the mouth of the Marina cannot be entirely precluded as habitat.

Potential impacts to the habitats and populations of this species (should it exist in this location) have been described in TERRBIO-1 and mitigations developed in TERRBIO-B. Page 3.4-26 of the Final EIR describes that a number of measures to avoid or minimize construction impacts would be required to minimize impacts to federally listed species. That text has been revised to include state listed or state fully-protected species.

DFG-31: California Black Rails and Clapper Rails both have only been noted in the Project area a handful of times in the last 25 years, each time only briefly. Given that their occurrence is rare, and that they would likely move in response to disturbance by preconstruction activity, no further minimization techniques seem warranted. The prohibition of "take" comment is noted.

DFG-32: Comment noted.

DFG-33: These comments are correct and noted. All of the CEQA guidelines for significance were considered, and are described on page 3.4-22. The analysis of the potentially significant impacts and potential mitigations in the case of the marsh associated species, are best described by the amount of habitat lost and gained.

DFG-34: See response DFG-31 above.

DFG-35: The appropriate preconstruction surveys proposed are described in the EIR and are consistent with Fish and Game code requirements. The wording of the comment seems to be asking for preconstruction surveys for "all terrestrial species to be impacted". We assume that is not the Department's intent.

DFG-36: Please refer to Master Response 1. CDFG expresses concern about noise-related impacts to nesting American avocets (*Recurvirostra americana*) and black-necked stilts (*Himantopus mexicanus*) in Pond A8, which is part of the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge), directly to the east of Alviso Slough. Project-related noise disturbance to nesting birds, including avocets and stilts, is a legitimate concern. We have information on nesting birds in Pond A8 from nest monitoring studies of avocets and stilts in Pond A8, as well as western snowy plovers (*Charadrius alexandrinus nivosus*) and Forster's terns (*Sterna forsteri*) (see Ackerman, et al., 2007 and Robinson et al. 2007). Few stilts nest in Pond A8, although in recent years the pond has been one of the largest breeding colonies of avocets in the South Bay. However, avocets tend to select nest sites in the interior of the pond, typically on inner levees and islands, with only sparse numbers of nests typically occurring on the eastern edge of the pond. Since most nests are on the interior, the noise created by Project activities in Alviso Slough is not likely to disturb nesting birds in the pond. Also, the bottom of Pond A8 is deep relative to the eastern levee. Therefore, the levee would serve as a buffer to nesting birds from noise generated from Project-related activities in Alviso Slough. Also, to the extent practicable, the Project would avoid construction-related activities during the western snowy plover nesting season, which encompasses both American avocet and black-necked stilt breeding seasons (see Mitigation Measure TERRBIO-C).

DFG-37: Comment noted, please refer to Master Response 3 regarding project objectives.

This page intentionally left blank.

SLC

STATE OF CALIFORNIA ARNOLD SCHWARZENEGGER, *Governor*

CALIFORNIA STATE LANDS COMMISSION
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202

PAUL D. THAYER, *Executive Officer*
(916) 574-1800 FAX (916) 574-1810
Relay Service From TDD Phone **1-800-735-2929**
from Voice Phone **1-800-735-2922**

Contact Phone: **(916) 574-1897**
Contact FAX: **(916) 574-1885**

July 28, 2008

File Ref: SCH# 2007082071

Mr. Michael F. Coleman
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

Subject: Draft EIR for the Alviso Slough Restoration Project

Dear Mr. Coleman:

Staff of the California State Lands Commission (CSLC) has reviewed the Draft Environmental Impact Report for the Alviso Slough Restoration Project. Under the California Environmental Quality Act (CEQA), the Santa Clara Water District is the lead agency and the CSLC is a Responsible Agency for any and all projects that could directly or indirectly affect sovereign lands, their accompanying public trust resources or uses, and the public easement in navigable waters.

The State acquired sovereign ownership of all tidelands and submerged lands and beds of navigable waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all the people of the State for statewide Public Trust purposes which include, waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. The landward boundaries of the State's sovereign interests are generally based upon the ordinary high water marks of these waterways as they last naturally existed. Thus, such boundaries may not be readily apparent from present day site inspections. The State's sovereign interests are under the jurisdiction of the CSLC. Portions of the project are located on lands currently leased to the Santa Clara Water District and South Bay Yacht Club along Alviso Slough. Staff of the Commission has been working with the Santa Clara Valley Water District regarding the proposed project and it is understood that an application to amend their current lease will be necessary. SLC-1

If you have any jurisdictional questions, please contact Nanci Smith, Public Land Manager, at (916) 574-1862 or by e-mail at smithn@slc.ca.gov. If you have any questions on the environmental issues, please contact Eric Gillies at (916) 574-1897 or by e-mail at gilliee@slc.ca.gov.

Sincerely,

Gail Newton, Chief
Division of Environmental Planning
and Management

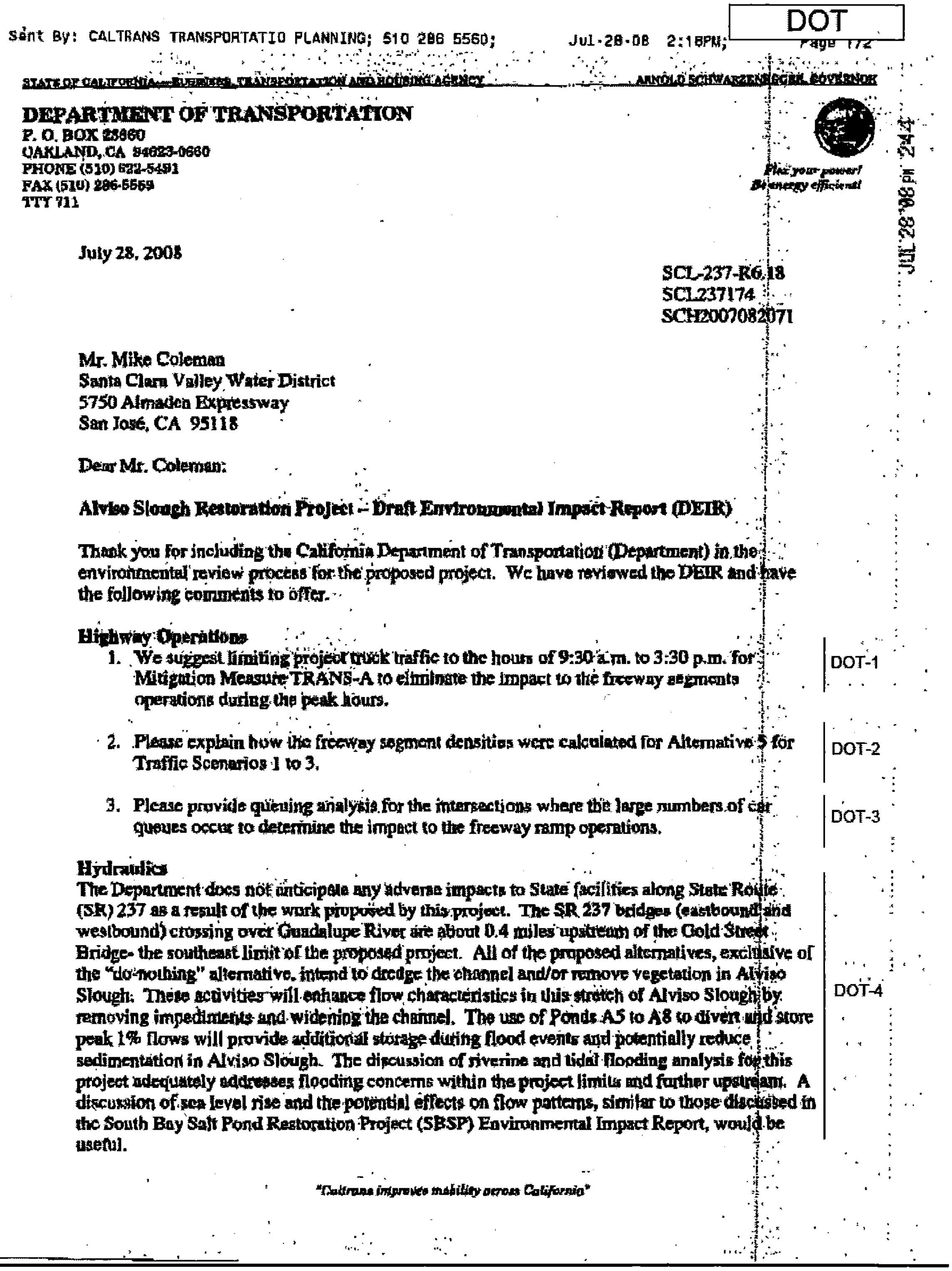
cc: Office of Planning and Research
State Clearinghouse

J. Brown, CSLC
N. Smith, CSLC
E. Gillies, CSLC

Response to State Lands Commission (SLC)

SLC-1: Comment noted.

This page intentionally left blank.



DOT

Sent By: CALTRANS TRANSPORTATIO PLANNING; 510 286 5560; Jul-28-08 2:18PM; Page 1/2

JUL 28 '08 PM 2:42

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, GOVERNOR

DEPARTMENT OF TRANSPORTATION
P. O. BOX 23660
OAKLAND, CA 94623-0660
PHONE (510) 622-5491
FAX (510) 286-5559
TTY 711

Flex your power!
Be energy efficient!

July 28, 2008

SCL-237-R6.18
SCL237174
SCH2007082071

Mr. Mike Coleman
Santa Clara Valley Water District
5750 Almaden Expressway
San José, CA 95118

Dear Mr. Coleman:

Alviso Slough Restoration Project – Draft Environmental Impact Report (DEIR)

Thank you for including the California Department of Transportation (Department) in the environmental review process for the proposed project. We have reviewed the DEIR and have the following comments to offer.

Highway Operations

1. We suggest limiting project truck traffic to the hours of 9:30 a.m. to 3:30 p.m. for Mitigation Measure TRANS-A to eliminate the impact to the freeway segments operations during the peak hours. DOT-1

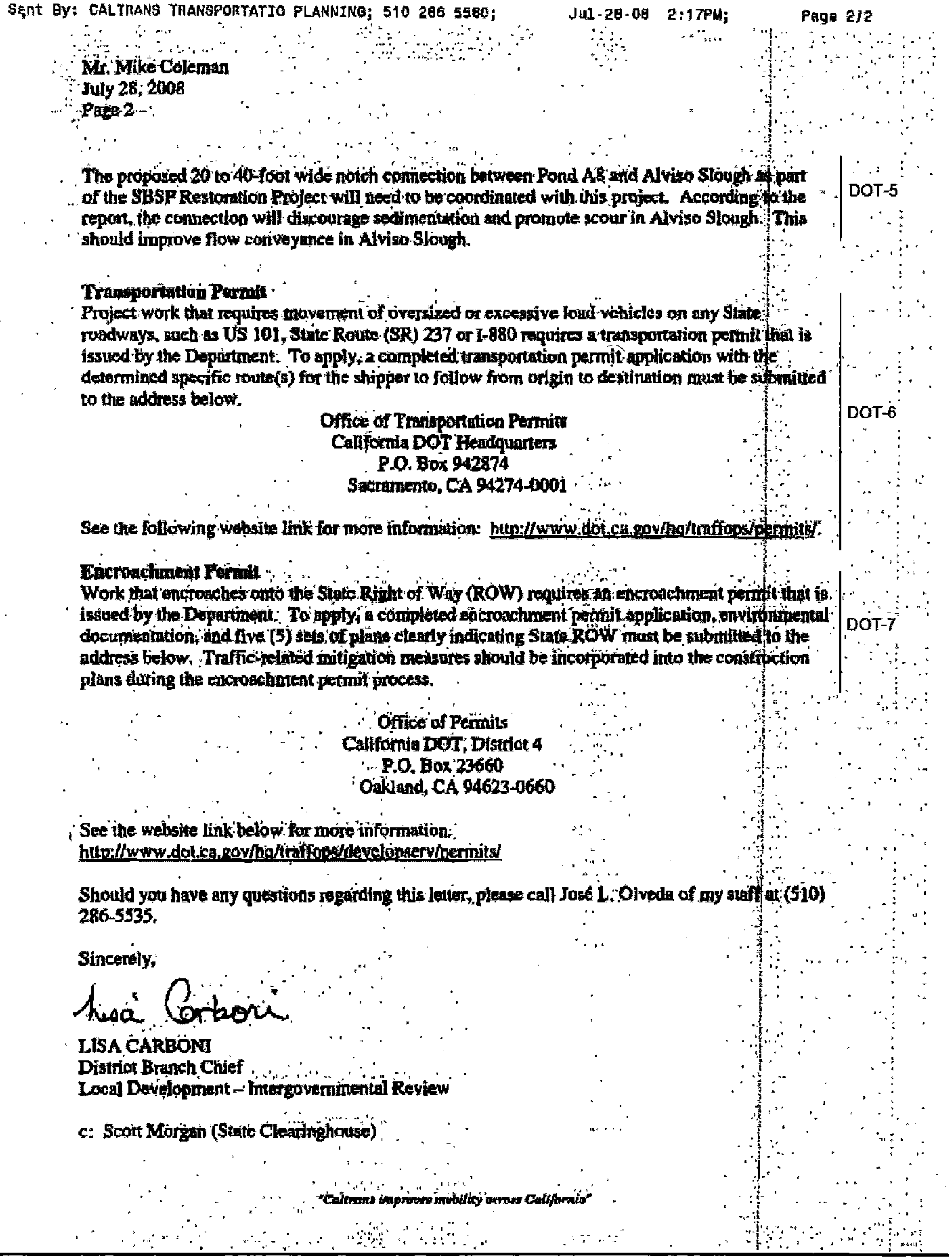
2. Please explain how the freeway segment densities were calculated for Alternative 5 for Traffic Scenarios 1 to 3. DOT-2

3. Please provide queuing analysis for the intersections where the large numbers of car queues occur to determine the impact to the freeway ramp operations. DOT-3

Hydraulics

The Department does not anticipate any adverse impacts to State facilities along State Route (SR) 237 as a result of the work proposed by this project. The SR 237 bridges (eastbound and westbound) crossing over Guadalupe River are about 0.4 miles upstream of the Gold Street Bridge- the southeast limit of the proposed project. All of the proposed alternatives, exclusive of the "do-nothing" alternative, intend to dredge the channel and/or remove vegetation in Alviso Slough. These activities will enhance flow characteristics in this stretch of Alviso Slough by removing impediments and widening the channel. The use of Ponds A5 to A8 to divert and store peak 1% flows will provide additional storage during flood events and potentially reduce sedimentation in Alviso Slough. The discussion of riverine and tidal flooding analysis for this project adequately addresses flooding concerns within the project limits and further upstream. A discussion of sea level rise and the potential effects on flow patterns, similar to those discussed in the South Bay Salt Pond Restoration Project (SBSP) Environmental Impact Report, would be useful. DOT-4

"Caltrans improves mobility across California"



Sent By: CALTRANS TRANSPORTATIO PLANNING; 510 286 5580; Jul-28-08 2:17PM; Page 2/2

Mr. Mike Coleman
July 28, 2008
Page 2

The proposed 20 to 40-foot wide notch connection between Pond A8 and Alviso Slough as part of the SBSP Restoration Project will need to be coordinated with this project. According to the report, the connection will discourage sedimentation and promote scour in Alviso Slough. This should improve flow conveyance in Alviso Slough. DOT-5

Transportation Permit
Project work that requires movement of oversized or excessive load vehicles on any State roadways, such as US 101, State Route (SR) 237 or I-880 requires a transportation permit that is issued by the Department. To apply, a completed transportation permit application with the determined specific route(s) for the shipper to follow from origin to destination must be submitted to the address below. DOT-6

Office of Transportation Permits
California DOT Headquarters
P.O. Box 942874
Sacramento, CA 94274-0001

See the following website link for more information: http://www.dot.ca.gov/hq/traffops/permits/.

Encroachment Permit
Work that encroaches onto the State Right of Way (ROW) requires an encroachment permit that is issued by the Department. To apply, a completed encroachment permit application, environmental documentation, and five (5) sets of plans clearly indicating State ROW must be submitted to the address below. Traffic-related mitigation measures should be incorporated into the construction plans during the encroachment permit process. DOT-7

Office of Permits
California DOT, District 4
P.O. Box 23660
Oakland, CA 94623-0660

See the website link below for more information.
http://www.dot.ca.gov/hq/traffops/developserv/permits/

Should you have any questions regarding this letter, please call José L. Olveda of my staff at (510) 286-5535.

Sincerely,

Lisa Carboni

LISA CARBONI
District Branch Chief
Local Development – Intergovernmental Review

c: Scott Morgan (State Clearinghouse)

"Caltrans improves mobility across California"

Response to California Department Of Transportation (DOT)

DOT-1: The District has agreed to limit truck traffic on the local freeway network to between 9:30 AM and 3:30 PM. Mitigation Measure TRANS-A in Section 3.13.3 has been revised to further limit truck travel in the afternoon by halting such activity at 3:30 PM instead of at 4:30 PM. This change has been incorporated into the traffic study and Mitigation Measure Trans-A.

DOT-2: Freeway densities were calculated based upon methodologies in the Santa Clara Valley Transportation Authority (VTA) Impact Analysis Guidelines (March 29, 2004). Density (vehicles per mile per lane) is equal to the peak hour volume (vehicles per hour) divided by the product of number of travel lanes multiplied by the average travel speed. For existing conditions, densities were obtained from the most recent annual monitoring report produced by VTA. For the addition of project traffic, the volume used in the density calculation is equal to the existing peak hour volume + the peak hour project traffic increment distributed on the freeway segment.

DOT-3: The table below presents 95th percentile vehicle queues for the highest volume Alternatives (4 and 5) at the four interchanges evaluated in this study for those approaches and turn lanes that would specifically be impacted by project trucks; and the maximum possible project truck trips generated for three access scenarios to State Route 237, via (1) Great America Parkway interchange, (2) North First Street interchange or (3) the Zanker Road interchange. Alternatives 1-3 volumes would be less than those in Table 4, but would still impact AM and PM peak hour traffic. As shown, all approach lanes accommodating project trucks would have available storage to accommodate 95th percentile vehicle queues with the inclusion of project truck traffic from the Alternatives resulting in the maximum levels of truck activity. Implementation of Mitigation Measure TRANS-A would mitigate the AM and PM peak hour impacts by limiting truck traffic between the hours of 9:00 a.m. and 3:30 p.m.

95th Percentile Vehicle Queues

			2010			
				BASE CASE + PROJECT		
			BASE CASE	ACCESS SCENARIO*		
INTERSECTION	**STORAGE**	**EXISTING**		**1**	**2**	**3**
AM PEAK HOUR						
Dixon Landing Rd./Rte 880 NB Ramps SB Right	150’	75	75	125	125	125
Dixon Landing Rd./Rte 880 SB Ramps WB Thru	850’/lane	250	275	275	275	275
Zanker Rd./Rte. 237 WB Ramps WB Right	350’	25	25	25	25	25
Zanker Rd./Rte. 237 EB Ramps SB Left	260’	75	100	100	100	100
No. 1st St./Rte. 237 WB Ramps						

			2010			
				BASE CASE + PROJECT		
			BASE CASE	ACCESS SCENARIO*		
INTERSECTION	STORAGE	EXISTING		1	2	3
WB Right	250'	100	125	125	125	125
No. 1st St./Rte. 237 EB Ramps						
SB Left	230'/lane	100	100	100	100	100
Great America Pkwy./Rte. 237 WB Ramps						
WB Right	440'	50	50	75	50	50
SB Thru	150'/lane	50	50	75	50	50
Great America Pkwy./Rte. 237 EB Ramps						
SB Left	200'	25	25	25	25	25
PM PEAK HOUR						
Dixon Landing Rd./Rte 880 NB Ramps						
SB Right	150'	50	50	75	75	75
Dixon Landing Rd./Rte 880 SB Ramps						
WB Thru	850'/lane	50	50	50	50	50
Zanker Rd./Rte. 237 WB Ramps						
WB Right	350'	25	25	25	25	25
Zanker Rd./Rte. 237 EB Ramps						
SB Left	260'	100	100	100	100	100
No. 1st St./Rte. 237 WB Ramps						
WB Right	250'	150	150	150	150	150
No. 1st St./Rte. 237 EB Ramps						
SB Left	230'/lane	125	125	125	125	125
Great America Pkwy./Rte. 237 WB Ramps						
WB Right	440'	150	150	175	150	150
SB Thru	150'/lane	75	75	75	75	75
Great America Pkwy./Rte. 237 EB Ramps						
SB Left	200'	75	75	75	75	75

Access Scenario:
1. S.R.237 freeway access via Great America Parkway interchange.
2. S.R.237 freeway access via North First Street interchange.
3. S.R.237 freeway access via Zanker Road interchange.

*Alternatives 4 and 5 only.

Source: Crane Transportation Group

DOT-4: Comment noted. The effect of sea level rise is discussed in EIR Section 4.2.2 Cumulative Impacts.

DOT-5: The coordination of the SBSP Restoration Project's Pond A8 notch with this proposed project has been addressed on page 1-10 and 1-11 of the Final EIR.

DOT-6: Impact TRANS-3 in Section 3.13.3 (Transportation and Traffic) has been revised to note that the movement of oversized or excessive load vehicles on any state roadways such as

US 101, State Route (SR) 237 or I-880 would require a transportation permit from the California Department of Transportation (Caltrans) (Final EIR page 3.13-14).

DOT-7: As the project would not occur on or encroach on any State Right of Way (ROW), an encroachment permit would not be needed.

This page intentionally left blank.

California Regional Water Quality Control Board
San Francisco Bay Region

Linda S. Adams
Secretary for Environmental Protection

1515 Clay Street, Suite 1400, Oakland, California 94612
(510) 622-2300 • Fax (510) 622-2460
http://www.waterboards.ca.gov/sanfranciscobay

Arnold Schwarzenegger
Governor

RWQCB

Date: July 28, 2008
File No. 2188.07 (MB)

Mr. Michael F. Coleman
Environmental Planner
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118
Via Email: MColeman@valleywater.org

SUBJECT: Comments on Draft Environmental Impact Report for the Santa Clara Valley Water District Alviso Slough Restoration Project, Town of Alviso, SCH# 2007082071

Dear Mr. Coleman:

San Francisco Bay Regional Water Quality Control Board (Water Board) staff has reviewed the Draft Environmental Impact Report (DEIR) for the Santa Clara Valley Water District (District) Alviso Slough Restoration Project (ASRP or Project). The District is considering five alternatives for further review that would remove between 3.7 and 9.7 acres of sediment from the Alviso Slough and the adjacent marsh, and between 2.6 and 15.3 acres of marsh vegetation in order to restore Alviso Slough (Slough) to pre-1983 conditions. The following comments are provided to the District to clarify issues of concern to Water Board staff prior to the completion of the Final EIR.

Comment #1

Page 1-5: The Project objectives are to "Restore Alviso Slough's channel width, and habitat to prior to 1983 conditions," improve boat navigation/tourism, public access and aesthetics, maintain 1 percent flood protection, decrease mosquito problems, and to integrate this Project with the South Bay Salt Pond Restoration Project (SBSPRP). Water Board staff is concerned that the ASRP is not a "restoration" project, as the term is usually understood in the regulatory community. In general, a restoration project represents an effort to return an ecosystem to a condition that approximates its condition prior to anthropogenic disturbances to some feasible extent. For example, the nearby South Bay Salt Pond Restoration Project is attempting to return managed salt ponds to tidal marsh habitat. In contrast, the ASRP is attempting to restore the width and depth of an approximately three-fifths of a mile long subsection of the Alviso Slough to its pre-1983 width and depth. The DEIR does a good job of summarizing the anthropogenic influences that have impacted Alviso Slough since arrival of European settlers in the South Bay.

RWQCB-1

Preserving, enhancing, and restoring the San Francisco Bay Area's waters for over 50 years

Recycled Paper

These influences include: 1) the diversion of the outlet of the Guadalupe River from Guadalupe Slough to Alviso Slough; 2) the reduction in magnitude of the tidal prism at Alviso as a result of the construction of flood control levees and salt pond levees; and 3) the increase in the amount of fresh water flowing through Alviso Slough as a consequence of the increase in the amount of impervious surfaces in the urbanized Guadalupe River watershed. These factors appear to have resulted in the conversion of the marshes along Alviso Slough from tidal marshes to brackish/freshwater marshes. Vegetation associated with this new marsh regime appears to be trapping more sediment along the channel banks. In addition, the reduction in the tidal prism has minimized tidal scour in Alviso Slough. The ASRP attempts to widen and deepen one segment of Alviso Slough without addressing the root causes of the current dimensions of the slough. In other words, the ASRP will introduce an unstable perturbation into the current geometry of Alviso Slough that cannot be maintained without constant human intervention. Maintenance of the ASRP's desired slough geometry will require ongoing disturbance of the habitat in Alviso Slough and impact the utility of Alviso Slough as a migratory pathway for anadromous fish. As is described below, the DEIR does not present adequate justification for such a condition of ongoing disturbance of habitat in the slough. RWQCB-1

In addition, the DEIR does not provide a solid, scientifically based rationale for selecting 1983 as the base year for establishing the objectives of the ASRP. RWQCB-2

Comment #2

The Water Quality Control Plan (Basin Plan) for the San Francisco Bay requires that, prior to receiving Clean Water Act Section 401 water quality certification and/or waste discharge requirements from the Water Board, projects must first demonstrate that they have avoided impacts, then minimized impacts, and after exhausting all opportunities for avoidance and minimization, provide mitigation for unavoidable impacts. Page 1-10 of the DEIR states that the planned South Bay Salt Pond Restoration Project (SBSPRP) would increase the tidal prism to Alviso Slough as part of the SBSPRP's Phase I Action at Pond A8 and "this Action would also restore more natural tidal processes that discourage sedimentation and promote scour along the channel of Alviso Slough." The no action alternative, in view of the future SBSPRP, would be an appropriate avoidance measure to protect water quality and beneficial uses in Alviso Slough. In a comment letter, dated September 13, 2007, on the NOP, Water Board staff requested that the DEIR evaluate the alternative of waiting to see how the increased tidal prism that will result from the SBSPRP's creation of a notch in the levee between Alviso Slough and Pond A8 would impact the channel width and depth in the Project reach. The DEIR does not adequately consider this alternative. RWQCB-3

Comment #3

In order to maintain the widened and deepened channel associated with implementing the ASRP, as discussed below under Comment #5, regular maintenance activities would be required to remove the sediment that will continue to accumulate in the Project reach and to remove the brackish or freshwater marsh vegetation that will continue to colonize marsh level surfaces at the site. Page 6-2 of the Draft Engineer's Report for the Project states that vegetation removal will RWQCB-4 most likely have to occur every year for the first few years to ensure complete removal of the root mass. Because the habitat along Alviso Slough will be disturbed on a regular basis, Water Board staff considers the impacts resulting from the Project to be essentially permanent and, therefore, all subsequent maintenance activities should be mitigated by a one-time mitigation plan. The impacts resulting from the Project, which will include the regular disturbance of aquatic habitat and the conversion of marsh habitat to open water, are substantial and therefore, mitigation should be appropriate to adequately compensate for such impacts. The Project's mitigation measures should also provide mitigation for the ongoing disturbance to fish migration through the Project reach as a result of ongoing maintenance dredging. RWQCB-4

The Project is also likely to divert more water over the weir between the slough and Pond A8 then currently occurs. When the water surface level of the slough is lowered through dredging and vegetation removal, the Project proposes to lower the weir between the slough and Pond A8, in order to maintain the existing split of flood flows between the slough and Pond A8. Since the channel bottom in the Project reach will be much lower than the channel bottom upstream and downstream of the Project reach, the Project reach is anticipated to become a sediment trap that will accumulate sediment much more rapidly than the unaltered portions of Alviso Slough. Therefore, it should be anticipated that, for much of the time between maintenance dredging and vegetation removal activities, the channel bottom in the Project reach will be shallower than the Project's target depth. During these times, the combination of the accumulated sediment in the slough and the lowered weir will result in a higher percentage of flows being diverted to the pond. This will result in a higher percentage of fish, including steelhead, being carried into the pond, where they will not be able to survive. Mitigation should be provided for impacts to the habitat that will result in the frequent removal of accumulated sediment from the weir location. Mitigation should also be provided for the increase in the amount of fish that will be lost to the pond, including an increased level of take of an endangered species. RWQCB-5

Comment #4
Page 3.2-22 and 3.2-23: Project activities will mobilize contaminated sediment, leading to a reduction in water quality. The DEIR proposes BMPs such as turbidity screens to prevent the dispersion of mobilized, contaminated sediment and water with increased turbidity. The DEIR should include a better explanation of how such BMPs will prevent the mobilization of contaminated sediments and reduce turbidity. Such details should include, but not be limited to, design specifications of the turbidity screens and any other BMPs to be implemented, the locations at which each BMP will be installed, the length of time that each BMP will need to be in place to control the dispersion of disturbed sediments, and the impacts of the proposed BMPs on wildlife (e.g., will the proposed turbidity screens block salmonid migration through the slough). RWQCB-6

Comment #5
The DEIR does not provide sufficient details for mitigating water quality impacts, habitat disturbance and conversion of wetland/marsh habitat to open water.

1. Pages 3.2-22 and 3.2-23 state the removal of sediment contaminated with mercury, PCBs, DDT, etc. is a beneficial impact. However, removing the first few feet would expose sediment that may have higher concentrations of contaminants. Exposure of sediment with higher concentrations of contaminates is not considered beneficial to water quality and the beneficial uses of Alviso Slough and South San Francisco Bay. Sediment characterization testing within the Project site would need to be completed prior to categorizing this impact as "beneficial." In addition, the contaminated sediments that would be removed by the Project are currently buried by less contaminated sediments. Therefore, the contaminants in the buried sediments are not currently bio-available, and their removal would not be a significant benefit to water quality in the slough. During dredging, some of these contaminated sediments will be dispersed, since sediment control BMPs are not capable of 100 percent effectiveness. The contaminants present in these dispersed sediments will be more bio-available than they are in their current "buried" state. RWQCB-7 Finally, the transport of dredged sediments from the slough to their final disposal location will result in the generation of air pollution, including greenhouse gasses. Therefore, it is likely the removal of the buried sediments would have a net negative impact on the environment. RWQCB-8
2. Mitigation Measure AQBIO-A: Maintaining a 20-foot marsh buffer does not apply to Alternative #5, which appears to be the most environmental damaging alternative. In addition, the mitigation measure refers to keeping a 20-foot buffer "where feasible", but provides no guidance to what the term "where feasible" means in the context of the Project. Therefore, the DEIR does not provide a real assurance that the 20-foot buffer would indeed be maintained. The DEIR should demonstrate where and how the 20-foot buffer will be maintained, and how impacts to water quality will be avoided and then minimized for Project alternative #5. Adequate mitigation must be provided for the loss of the buffer, this mitigation is not present in the DEIR. RWQCB-9
3. Mitigation Measure AQBIO-B: Maintenance activities including vegetation removal and sediment excavation are projected to occur every 3-6 years depending on the Project alternative. The Draft Engineer's Report states vegetation removal activities may have to occur every year for the first few years. Page 3.3-28 states that given the Project's frequent maintenance intervals, the disturbed habitat may never fully recover. Therefore, mitigation measure AQBIO-B is not considered adequate or appropriate for such impacts, which will be considered permanent since the disturbed habitat will not have the chance to fully recover between disturbances. Also, as noted above, sediment control devices are likely to impact fish migration through the Project reach; no mitigation has been provided for this impact. RWQCB-10
4. Mitigation Measure TERRBIO-B: The DEIR does not provide specific details of compensatory mitigation for the permanent impacts to the wetlands and marsh habitats. Proposed mitigation measures should be presented in sufficient detail for readers of the CEQA document to evaluate the likelihood that the proposed remedy will actually reduce impacts to a less than significant level. CEQA requires that mitigation measures for each significant environmental effect be adequate, timely, and resolved by the lead agency. In RWQCB-11

> an adequate CEQA document, mitigation measures must be feasible and fully enforceable through permit conditions, agreements, or other legally binding instruments (CEQA Guidelines Section 15126.4). Mitigation measures to be identified at some future time are not acceptable. It has been determined by court ruling that such mitigation measures would be improperly exempted from the process of public and governmental scrutiny which is required under the California Environmental Quality Act. The DEIR should be re-circulated with a concrete mitigation proposal that addresses all of the concerns raised in this letter by Water Board staff. Moving directly to a Final EIR without first circulating concrete mitigation proposals for public review is not likely to result in a CEQA document that would be adequate to support the issuance of CWA Section 401 certification and WDRs for the proposed Project.

RWQCB-11

Comment #6

The DEIR has stated various potential work-windows for construction activities to avoid any conflict with the breeding seasons of special-status species. For example, page 3.3-21 of the DEIR states that "In-water work windows should be timed to occur when sensitive fish species are not present or least susceptible to disturbance (e.g, June through September)." Page 3.4-23 refers to terrestrial species and states "…work in areas that could cause disturbance, injury, or mortality (e.g., accidental crushing of individuals or nests) would be limited to the period September 1 through February 28, to the extent practicable." Page 3.4-25 states "Construction-related activities shall be restricted to the non-breeding season for special-status, marsh-related wildlife species. This shall limit activities to the period September 1 through February 28." Therefore, it is unclear at what time the work will be conducted. Table 3.4-4 on pages 3.4-16 through 3.4-20 also list many special status species that are likely to occur in the Project area for periods ranging from a few months to year round. Since it appears that work must be performed during a period that would either impact fish or terrestrial species, the DEIR should clearly have identified the selected work window. The DEIR should be re-circulated with the selected work window, a description of the species that may be impacted by the selected work window, and appropriate mitigation measures to minimize those impacts.

RWQCB-12

Comment #7

Multiple areas in the DEIR have addressed SBSPRP's operation of a new notch in the levee between the Slough and Pond A8, in which the notch would be either closed or open to a width of 20 feet or 40 feet to allow tidal flows to enter Alviso Slough from pond A8. Notch operations whether open or closed can lead to possible impacts including fish entrainment, increased flood risk, and decreased water quality in Pond A8 and Alviso Slough. Each issue has specific requirements, which necessitates that the notch is either open or closed during the winter. Page 3.1-21 indicates that modeling has not been done to assess the impacts resulting from the combined effect of the Project and the SBSPRP if the notch were to remain open during the winter. Allowing the notch to be open during the winter (rainy season) can reduce flood protection, increase the risk of mobilization of algae blooms, which can lead to a decrease in dissolved oxygen (DO) levels, and mobilization of other pollutants into Alviso Slough. Modeling should be conducted to assess impacts to wetland and marsh habitat resulting from the

RWQCB-13

combination of the Project and SBSPRP's proposed operation of the notch in the Pond A8 levee. Then, the appropriate BMPs and mitigation should be determined for any likely impacts. These mitigation measures should be submitted for public review in a re-circulated DEIR. RWQCB-13

In addition, implementation of the Project may compromise the ability of the SBSPRP to adaptively manage Pond A8. Mechanical vegetation and sediment removal will mask the extent of scour caused by increased tidal action through the notch. Water Board staff request that the Project be delayed until after the SBSPRP has been able to assess the impacts of flow through the notch on tidal scour in Alviso Slough. RWQCB-14

Comment #8

Alternatives 3 through 5 propose dredging to a depth of 8 feet to 16 feet. The DEIR states that sediment core samples were taken outside of the Project site to test for contaminant levels. Representative sediment core samples should be taken from within the Project area. Sufficient sediment sampling will be needed to characterize both the contaminant levels in the dredged material and in the newly exposed, as-built channel bed. The Water District staff will need to coordinate with Water Board staff on an appropriate sediment characterization plan. RWQCB-15

Comments on the NOP

In a comment letter, dated September 13, 2007, on the NOP for the Project, Water Board staff identified several concerns that should be addressed in the DEIR. However, the DEIR does not adequately address all of these concerns.

Comment 4a on the NOP

This comment included the language,

"Page 4: The project purpose is to restore the Slough to pre-1983 conditions, to create more open waters, enhance natural aesthetics, improve recreation access and restore historic uses of the Slough. Each purpose is addressed individually: RWQCB-16

> a. Restore Slough to pre-1983 conditions: As stated, the Slough has changed over the past several years due to human influences on the local environment. The proposal to restore the Slough to pre-1983 conditions assumes that these conditions are better than current conditions. The DEIR should clarify this assumption and provide supporting, science-based information, including why achievement of Project purposes are worth the environmental impacts that would result."

This comment is not adequately addressed in the DEIR.

Comment 4b on the NOP

This comment included the language, RWQCB-17

"The DEIR should provide a science-based assessment of how the historic Slough conditions were supportive of beneficial uses, how this has changed, and why the proposed conditions of open waters should be restored." RWQCB-17

This comment is not adequately addressed in the DEIR.

Comment 4d on the NOP
This comment included the language,

"Water Board staff support recreation and access through recognizing water contact and noncontact water recreation beneficial uses in the Basin Plan. However, the other beneficial uses listed above also need to be considered in determining impacts of the Project. Currently, the San Francisco Bay Trail runs along the entire length of the east side of Alviso Slough from the UPRR Bridge to the confluence with South San Francisco Bay. According to the Bay Trail website, there are plans to connect to the Guadalupe River Trail and the San Tomas Aquino Trail. In addition, the proposed County Park Expansion Site project will provide additional boating access to the Slough, if it is approved. Therefore, the DEIR needs to clearly describe why additional recreation access is necessary and why impacts to water quality and beneficial uses are justified." RWQCB-18

This comment is not adequately addressed in the DEIR.

Comment 4e on the NOP
This comment included the language,

"The District should assess whether it is appropriate to incur direct and on-going maintenance impacts to existing wetlands that developed as conditions changed in the area surrounding Alviso Slough. Changes in hydrology, water quality, sediment supply and transport have altered much of South San Francisco Bay and resulted in existing conditions in Alviso. Vegetation removal and dredging will not restore the natural processes that maintained the Slough as it once was. The SBSP could result in the passive restoration of some or all of these conditions and the uses they allowed as described in the NOP...." RWQCB-19

This comment is not adequately addressed in the DEIR.

Comment 5c on the NOP
This comment included the language,

"Maintain 100 year flood protection: On September 26, 2002, the Water Board approved Order No. R2-2002-0089 for the Santa Clara Valley Water District Lower Guadalupe River Flood Protection Project. This project was designed to provide flood protection along the lower reaches of the Guadalupe River and for the community of Alviso. It was completed in 2006. Components of the project included aggressive management of approximately 738 linear feet of RWQCB-20 wetland vegetation along the east side of the Slough and construction of an overflow weir into Salt Ponds A5, A6, A7, A8D, and A8W. According to the District's flood protection project application for water quality certification and waste discharge requirements, these activities resulted in approximately 2.34 acres of permanent and 3.07 acres of temporary wetland impacts in Reach G and in the Baylands reach adjacent to the community of Alviso. The DEIR should describe why additional impacts to water quality and beneficial uses are warranted shortly after completion of this flood protection project."

This comment is not adequately addressed in the DEIR. The DEIR should evaluate the combined impact of the flood control project, including ongoing vegetation management at the weir to the ponds, and the impacts associated with the combined project. RWQCB-20

Comment 5d on the NOP
This comment included the language,

"Reduce mosquito nuisance: Water Board staff recognize the human health issues related to mosquito born illnesses and to this end work with local mosquito and vector control districts whenever necessary. However, because tidal wetlands are an important habitat the DEIR should clearly describe why there is a need to remove wetland vegetation in the Slough in order to control mosquito populations. A thorough assessment of the current mosquito nuisance problem and the projected positive impacts of removing wetland vegetation should be provided."

This comment is not adequately addressed in the DEIR. RWQCB-21

Comment 5e on the NOP
This comment included the language,

"Promote integration with the SBSP: Water Board staff appreciate the District's desire to promote integration with the SBSP but are not clear how the Project will accomplish this. The DEIR should clarify how the Project and the SBSP are integrated and whether it compliments or conflicts with the goals and objectives of the SBSP."

As noted above, implementation of the Project before implementation of the Pond A8 notch to the slough will make it impossible to independently evaluate the impact of the notch on tidal scour in the slough. Therefore, the Project should be delayed until the impacts of the notch on the slough can be evaluated by the SBSPRP. This comment is not adequately addressed in the DEIR. RWQCB-22

Comment 6ai on the NOP
This comment included the language, RWQCB-23

"The DEIR should describe impacts to water quality and beneficial uses due to increased turbidity, including how emulsification of sediments could result in continued scour and turbidity." RWQCB-23

This comment is not adequately addressed in the DEIR.

Comment 6aiii on the NOP
This comment included the language,

"Chemical Treatment: The Project could result in the application of a significant amount of herbicides for both the initial removal and ongoing maintenance of vegetation. In order to be effective, most herbicide applicators will likely recommend the use of a surfactant with the herbicide. The District is currently approved to use specific aquatic herbicides and surfactants to maintain flood capacity and control invasive species under the Multi-Year Stream Maintenance Program (SMP). Best management practices (BMPs) are required, especially in streams that support salmonids. The DEIR should describe how the Project would be consistent with the SMP and what BMPs will be used to protect salmonids and other special status species in Alviso Slough." RWQCB-24

This comment is not adequately addressed in the DEIR. The DEIR should include a more detailed discussion of proposed BMPs for the Project.

Comment 6e on the NOP
This comment included the language,

"Abandoned Vessel Removal: The NOP states that the Project will remove abandoned vessels and navigational hazards in the Project area. On January 11, 2006, the Bay Conservation and Development Commission provided written notification to the South Bay Yacht Club, located within the Project footprint, that they were required to remove seven abandoned and live-aboard vessels from Alviso Slough. The DEIR should clarify whether these vessels are still in Alviso Slough and whether these are the abandoned vessels that would be removed as part of the Project." RWQCB-25

This comment is not adequately addressed in the DEIR.

Summary Comment
As is described above, Water Board staff believe that there are numerous potentially significant issues that have not been addressed in the DEIR for the Project. In particular, the DEIR has not provided specific mitigation measures for public review and the DEIR has not conclusively demonstrated the Project will have benefits that would compensate for its impacts. Because of this, we are encouraging the District to prepare a thorough revision of the DEIR for re-circulation. Moving directly to a Final EIR without first circulating a revised DEIR for public RWQCB-26

review is not likely to result in a CEQA document that would be adequate to support the issuance of CWA Section 401 certification and WDRs for the proposed Project.

Water Board staff is concerned that the Project will result in a continuous state of habitat disruption in Alviso Slough in exchange for Project benefits that do not commensurate with the level of potential environmental impacts. The analysis of impacts to waters of the State and the discussion of proposed mitigation measures for those impacts are not currently adequate to support the issuance of permits for this Project by the Water Board. RWQCB-26

Thank you for considering these comments in preparation of the Final EIR. If you have any questions, please contact Margarete Beth at (510) 622-2338, or via e-mail at mabeth@waterboards.ca.gov.

Sincerely,

Dale Bowyer, Section Leader
Southeast Watershed Section

cc: Ms. Holly Costa, Corps – Regulatory – San Francisco
Ms. Luisa Valiela, USEPA – Region 9 – San Francisco
Ms. Maura Eagan Moody, NOAA Fisheries, Santa Rosa
Mike Thomas, USFWS, Sacramento
Tami Schane, DFG - Yountville

Response to Regional Water Quality Control Board (RWQCB)

RWQCB-1: Please refer to Master Response 3 concerning project objectives. The project is not described as an ecological restoration project. It is more of a historical restoration. The District recognizes that maintenance would be a continuing requirement. Channel maintenance is a common activity in channels used for navigation throughout the greater San Francisco Bay.

RWQCB-2: Please refer to Master Response 3 concerning the project objectives.

CEQA does not require a scientific basis for identifying project objectives. CEQA guidelines 15124 (b) requires that the EIR identify objectives that will help the lead agency define a reasonable range of alternatives to evaluate.

The year 1983 was selected as a restoration objective only because it was representative of conditions deemed generally acceptable to the Alviso community. It is recognized that the slough has been altered by human activities since the late 1800's, but the results of these alterations accelerated in the 1980's and thereafter, as evidenced by historic photography (see EIR Figure 1-3).

The EIR recognizes that maintenance would be a continuing requirement. Channel maintenance is a common activity in channels used for navigation throughout the greater San Francisco Bay. Construction maintenance and the associated impacts on anadromous fish are addressed in the Final EIR on pages 3.3-24 under Impact AQBIO-1, Construction-related increases in sediments and turbidity; on page 3.3-26 under Impact AQBIO-2, Release and exposure of construction-related contaminants; on page 3.3-26 under Impact AQBIO-3, Construction-related release and exposure of legacy contamination in sediments; and on page 3.3-28 under Impact AQBIO-4: Construction-related habitat disturbance.

The EIR presents no assumptions that any of the proposed alterations are better than the existing conditions. A fact-based objective analysis is presented to assess the effects of the proposed action.

RWQCB-3: The comment on the no action alternative is noted. The noted impacts on the channel provide insufficient information on what the commenter needs to deem the certification of the EIR adequate. The suggested alternative of waiting until the effects of the SBSP Restoration Project are clear does not constitute a viable alternative as defined by CEQA: it would only be a deferral of one of the existing alternatives and would not meet any of the project objectives. Further, since the effects of the SBSP Restoration Project could not be known for some time, the evaluation of its effects and the project's effects would be speculative to assess at this time, or at the least would not provide any new information from that already addressed by the Draft EIR.

RWQCB-4: These issues were addressed in the Draft EIR. Mitigation has been identified for all significant impacts (EIR Table ES-2). Impacts to the aquatic environment that would result from initial construction and reoccurring maintenance activities are addressed in Impacts AQBIO 1 through AQBIO 6 (Section 3.3.3). Mitigation Measures AQBIO-A, AQBIO-B (Section 3.3.3), and TERRBIO-B (Section 3.4.3) would reduce potential impacts (associated with both initial construction and reoccurring maintenance activities) to less than significant; impacts that cannot be mitigated to less than significant would be considered significant and unavoidable.

RWQCB-5: Impact AQBIO-7 and Mitigation Measure HYD-A address potential impacts associated with increased entrainment of fish species into Pond A8. Implementation of Alternative Nos. 1 through 5 would affect flow conveyance conditions in Alviso Slough downstream of the Pond A8 weir. These changes in channel conveyance conditions would, in turn, change the flow split function of the Pond A8 weir under high flow conditions (see EIR Table 3.3-10 for modeling results). The weir at Pond A8 was designed to allow overflows from Alviso Slough as infrequently as possible to minimize the entrainment of fish, including steelhead, into Pond A8. Lowering of the weir (to varying levels depending on the project alternative [see Mitigation Measure HYD-A]) would maintain the 2005 hydraulic baseline flow split condition for each alternative. Please also see Master Response 4.

As described above under response to comment RWQCB-4, impacts to the aquatic environment that would result from initial construction and reoccurring maintenance activities are addressed in Impacts AQBIO-1 through AQBIO-6. Mitigation Measures AQBIO-A, AQBIO-B, and TERRBIO-B would reduce potential impacts (associated with both initial construction and reoccurring maintenance activities) to less than significant; impacts that cannot be mitigated to less than significant would be considered significant and unavoidable.

RWQCB-6: See response to comment DFG-12 and DFG-13 for a discussion on turbidity screens and silt fences. Impacts on fish migration associated with use of the turbidity screens and silt fences would be avoided and/or minimized to a less than significant level with the identification and implementation of construction windows (developed in consultation with USFWS, NMFS, and CDFG). Turbidity screens and silt fences would only be installed during construction periods, which, in turn, would only occur during construction window periods.

RWQCB-7: Please refer to Master Response 2, Mercury Contamination and Bioaccumulation Effects on Aquatic and Terrestrial Organisms. The District recognizes that removal of contaminated sediment may expose sediment with higher concentrations of contaminants may not be beneficial and has revised Section 3.2.2 of the Final EIR and added Mitigation Measures WQ-A and WQ-B to reduce impacts to a less than significant level.

The significant determination for Impact WQ-4 has been changed to Less than Significant with Mitigation. Mitigation Measure WQ-A would include drilling cores and analysis of sediment samples in the construction are to determine sediment disposal or reuse options and the resulting contaminant concentrations in surficial sediments exposed by dredging and vegetation removal. Mitigation Measure WQ-B would require choosing a method of dredging that minimizes dispersion of suspended sediments.

RWQCB-8: The short-term or temporary air quality impacts from project construction including the transport of dredged materials are described in EIR Section 3.8 under Impact AQ-1.

RWQCB-9: Mitigation Measure AQBIO-A would be applied to Alternatives 1 through 5. Because the mitigation measure may not be feasible (in direct conflict with proposed vegetation removal) for Alternatives Nos. 2 through 5 and this impact (loss of marsh vegetated edge habitat) cannot be mitigated through other measures, this impact (Impact AQBIO-4) would be significant and unavoidable.

RWQCB-10: It is acknowledged that Mitigation Measure AQBIO-B cannot reduce Impact AQBIO-4 to a less than significant level for Alternatives 2 through 5; therefore, these impacts would be significant and unavoidable, as noted in the EIR.

In regard to potential impacts to fish associated with the use turbidity screen and silt fences, see response to comment RWQCB-6.

RWQCB-11: Please refer to response to comment DFG-24 for further discussion of proposed mitigation. The final details for mitigation, including site selection, would be determined when a project alternative is approved by the District's Board of Directors. The mitigation plan would be subject to review in the permitting phase. The mitigation measure and additional discussion provided in response to comment DFG-24 provide adequate information and detail regarding mitigation requirements, including monitoring to determine that the mitigation requirements would ensure that the mitigation is a success (i.e. providing necessary compensatory habitat functions and values).

The District would work cooperatively with other agencies to identify sites that would satisfy the needed mitigation requirements. These sites may be ones that the District already owns, or that are within the SBSP Restoration Project.

RWQCB-12: Please refer to Master Response 1: Construction Windows.

RWQCB-13: With regard to the specific issue of the potential for low dissolved oxygen levels, the purpose of introducing the notch in Pond A8 is to improve circulation, which is a benefit to dissolved oxygen. Were the notch to be opened year-round, circulation would be improved year-round. Noting that algal blooms do not occur in winter, the concern for export of Biological Oxygen Demand (BOD) from Pond A8 into Alviso Slough appears to be exaggerated. The scientific understanding, as discussed by the South Baylands Mercury Project Team in February 2008, was that the notch in Pond A8 would result in a deposition of organic matter in Pond A8, not an export from Pond A8 to Alviso Slough.

RWQCB-14: The preference for delaying the project is noted. However, as stated in the response to RWQCB-3, the suggested alternative of waiting until the effects of the SBSP Restoration Project are clear does not constitute a viable alternative as defined by CEQA: it would only be a deferral of one of the existing alternatives and would not meet any of the project objectives. In all likelihood, since the SBSP Restoration Project is further along in the CEQA/NEPA planning and design process, the SBSP Phase I Actions would be completed in advance of the Alviso Slough Restoration Project Since the effects of the SBSP Restoration Project (as described below) could not be known for some time, the evaluation of its effects and the project's effects would be speculative to assess at this time, or at the least would not provide any new information from that already addressed by the Draft EIR.

The SBSP Restoration Project Phase 1 Action at Pond A8 is scheduled for construction in 2009 and 2010. The expected timeframe for decision making with respect to channel scour is approximately five years to decades, with a rapid initial channel scour response expected within approximately five years followed by slower changes over decades (USFWS and DFG 2007). The Alviso Slough Restoration Project may be implemented in 2010, 2011, or as determined by the District Board.

The SBSP Restoration Project applied study at Pond A8 would monitor and evaluate channel scour response to tidal flow through the notch at Pond A8. Implementation of the Alviso Slough Restoration Project within the first five to ten (approximately) years of implementation of the Phase 1 Action at Pond A8 would make it more difficult to isolate the effects of the Phase 1 Action alone and possibly complicate the calculation of combined tidal action (tidal prism) given the expected cycle of sedimentation and maintenance dredging with the Alviso Slough Restoration Project. The evaluation of the effects of increased tidal prism on Alviso Slough scour with the two projects implemented close together in time, would be possible, though less precise.

RWQCB-15: Please refer to Master Response 2. Existing information, including data from the South Baylands Mercury Project and supplemental measurements of core samples by the District that is presented in the EIR, is sufficient to analyze the potential for environmental impacts and benefits. Mitigation Measure WQ-A requires drilling cores and analysis of sediment samples in the construction are to determine sediment disposal or reuse options and the resulting contaminant concentrations in surficial sediments exposed by dredging and vegetation removal.

RWQCB-16: Please refer to Master Response 3 related to project objectives. The comment does not specify what information is needed to be obtained that would result in adequate information in the view of the commenter.

RWQCB-17: Please refer to Master Response 3. 1983 was selected as a restoration objective only because it was representative of conditions deemed generally acceptable to the Alviso community. It is recognized that the slough has been altered by human activities since the late 1800's, but that alteration accelerated in the 1980's and thereafter as evidenced by historic photography (Figure 1-3).

RWQCB-18: Please refer to Master Response 3. The EIR recognizes and discusses all objectives of the Basin Plan. The EIR authors do not prioritize these objectives and the document lays out a thorough analysis of the project consequences. It is the purview of the decision-makers to determine if the merits of the project outweigh its consequences. It is important to note that the EIR does not state that the project is a "necessary" action in relation to recreation or other objectives. The project, however, does have widespread support in the Alviso community and many residents do regard improved navigation in the channel as a highly desirable action with very beneficial results that would accrue to the community, as well as a matter of social justice.

The reach of Alviso Slough downstream of the Gold Street Bridge has experienced a gradual decline in channel width and increasing encroachment from vegetation over many years. These conditions result from over a century of human activities such as groundwater over-pumping, the manipulation of the South Bay marshlands and drainage channels for agricultural and salt-making purposes, the realignment of channel meanders for more efficient flow conveyance, and urban development in the watershed. These anthropogenic influences, combined with natural processes attempting to achieve a level of equilibrium, have resulted in a reduced channel width and depth that precludes the community's ability to use the slough, as it once did, for navigational and recreational access. The community of Alviso advocated returning the slough to its pre-1983 conditions because this period is remembered by members of the Alviso community as a time when the width of the channel was sufficiently wide for navigation and recreation.

RWQCB-19: Please refer to Master Response 3. The EIR recognizes that maintenance would be a continuing requirement. Channel maintenance is a common activity in channels used for navigation throughout the greater San Francisco Bay. In addition, as noted in response to RWQCB-1, the project is not described as an ecological restoration project intended to restore the Slough to condition and natural processes that existed prior to much of the current anthropogenic alteration.

RWQCB-20: Please refer to Master Response 3.

RWQCB-21: Please refer to Master Response 3.

RWQCB-22: The relationship and complementary nature of the Alviso Slough project and the SBSP Restoration Project is described in the EIR in Section 1.4.1, which provides an overall description of the relationship between the two projects, and in Section 3.1.4 which specifically addresses the hydrologic conditions and relationships.

As stated in Section 1.4.1, the Alviso Slough Restoration Project could accomplish in the very near term a portion of the channel widening that the SBSP Restoration Project could (if approved) accomplish over a much longer period of time. Conversely, the SBSP

Restoration Project could provide sustainability for a larger slough channel over the long term, and lessen or avoid the need for ongoing maintenance dredging and/or vegetation removal associated with the Project.

The Alviso Slough Restoration Project does not interfere with the SBSP Restoration Project; it may accelerate the expected results of the SBSP Restoration Project.

RWQCB-23: The project alternatives would remove sediment from the Project area, creating a sediment sink. Thus, there is the potential to decrease turbidity within the Project area. Downstream of the Project area, the additional tidal prism created by the project alternatives has the potential to cause scour of the channel banks, thereby increasing turbidity. The net effect on turbidity in Alviso Slough is uncertain. However, Alviso Slough is a naturally turbid estuarine environment and turbidity changes due to the project alternatives are not expected to be significantly greater than naturally-occurring changes in turbidity.

RWQCB-24: Chemical treatment of vegetation is not being considered for the initial removal of vegetation or ongoing maintenance. This is described in Section 2.3.1 of the EIR.

RWQCB-25: The Bay Conservation and Development Commission (BCDC) has issued numerous written notifications over the past several years to the SBYC and other boat owners or entities regarding abandoned boats and live-aboard vessels in Alviso Slough. Seven abandoned vessels have been removed by the SBYC in recent months. The text of the EIR has been modified to update, to the best extent possible, the current number of abandoned vessels that exist in the Project area (Final EIR page 2-6).

RWQCB-26: Comment noted.

SCH1

STATE OF CALIFORNIA
GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH
STATE CLEARINGHOUSE AND PLANNING UNIT

ARNOLD SCHWARZENEGGER
GOVERNOR

CYNTHIA BRYANT
DIRECTOR

July 29, 2008

Mike Coleman
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

Subject: Alviso Slough Restoration Project
SCH#: 2007082071

Dear Mike Coleman:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on July 28, 2008, and the comments from the responding agency (ies) is (are) enclosed. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that:

> "A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

SCH1-1

These comments are forwarded for use in preparing your final environmental document. Should you need more information or clarification of the enclosed comments, we recommend that you contact the commenting agency directly.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.

Sincerely,

Terry Roberts

Terry Roberts
Director, State Clearinghouse

Enclosures
cc: Resources Agency

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044
(916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

This page intentionally left blank.

Response to State Clearinghouse (SCH1)

SCH1-1: The comment letter is proof of transmittal of the Draft EIR to state agencies. The State Clearinghouse transmittal included the letter from the California Department of Transportation. Responses are provided to comments DOT-1 through DOT-7.

This page intentionally left blank.

SCH2

STATE OF CALIFORNIA
GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH
STATE CLEARINGHOUSE AND PLANNING UNIT

ARNOLD SCHWARZENEGGER
GOVERNOR

CYNTHIA BRYANT
DIRECTOR

July 30, 2008

Mike Coleman
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

Subject: Alviso Slough Restoration Project
SCH#: 2007082071

Dear Mike Coleman:

The enclosed comment (s) on your Draft EIR was (were) received by the State Clearinghouse after the end of the state review period, which closed on July 28, 2008. We are forwarding these comments to you because they provide information or raise issues that should be addressed in your final environmental document.

The California Environmental Quality Act does not require Lead Agencies to respond to late comments. However, we encourage you to incorporate these additional comments into your final environmental document and to consider them prior to taking final action on the proposed project. SCH2-1

Please contact the State Clearinghouse at (916) 445-0613 if you have any questions concerning the environmental review process. If you have a question regarding the above-named project, please refer to the ten-digit State Clearinghouse number (2007082071) when contacting this office.

Sincerely,

Terry Roberts

Terry Roberts
Senior Planner, State Clearinghouse

Enclosures
cc: Resources Agency

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044
(916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

This page intentionally left blank.

Response to State Clearinghouse (SCH2)

SCH2-1: Comment noted. The State Clearinghouse letter includes the letter from the California Department of Fish and Game submitted after the close of the comment period. These comments are responded to under letter DFG in responses DFG-1 through DFG-37.

This page intentionally left blank.

BCDC

Making San Francisco Bay Better

August 1, 2008

Mr. Michael F. Coleman
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, California 95118

SUBJECT: Alviso Slough Restoration Project, Town of Alviso, Santa Clara County, Draft Environmental Impact Report, State Clearinghouse No. 2007082071

Dear Mr. Coleman:

On June 16, 2008, San Francisco Bay Conservation and Development Commission staff received the Draft Environmental Impact Report (EIR) for the Alviso Slough Restoration Project, proposed on the banks of Alviso Slough, between the Gold Street Bridge and the Alviso County Marina, in the lowest reach of the Guadalupe River, in the Town of Alviso, in Santa Clara County. The Draft EIR states that the purpose of the proposed project is to, "...[r]estore Alviso Slough to pre-1983 conditions when more open water habitat allowed for better navigation and recreation in the area...." To accomplish this goal, the EIR identifies several different project alternatives that involve vegetation removal, dredging of Bay sediments and modifications to the Pond A8 weir and maintenance activities along Alviso Slough.

Although the Commission itself has not reviewed the environmental document, the staff comments are based on the McAteer-Petris Act and the San Francisco Bay Plan.

Jurisdiction

The Commission's area of jurisdiction includes all tidal areas of the Bay up to the line of mean high tide, all areas formerly subject to tidal action that have been filled since September 17, 1965, marshlands lying between mean high tide and five feet above mean sea level, and the "shoreline band," which extends 100 feet inland from and parallel to the Bay jurisdiction. The Commission also has jurisdiction over the Suisun Marsh and other managed wetlands adjacent to the Bay, salt ponds, and certain waterways.

Commission permits are required for certain activities, including construction, changes of use, dredging, and dredged material disposal, within its area of jurisdiction; permits are issued if the Commission finds the activities to be consistent with the McAteer-Petris Act and the policies and findings of the Bay Plan.

It appears that vegetation removal and dredging activities along Alviso Slough would occur within the Commission's Bay jurisdiction, and modifications to the Pond A8 weir would be located within the Commission's salt pond jurisdiction. Additionally, BCDC-1

State of California • **SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION** • *Gray Davis, Governor*
50 California Street, Suite 2600 • San Francisco, California 94111 • (415) 352-3600 • *Fax* (415) 352-3600 • info@bcdc.ca.gov • www.bcdc.ca.gov

it appears that two construction staging areas (identified as "1. Cargill, Inc., and 2. Pellegrini" in Figure 2-7 of the Draft EIR) would potentially be located within the Commission's 100-foot shoreline band jurisdiction. Thus, a permit from the Commission would be required to construct the proposed project. BCDC-1

Tidal Marshes and Mitigation

The Bay Plan policies on tidal marshes state, "Tidal marshes and tidal flats should be conserved to the fullest possible extent. Filling, diking and dredging projects that would substantially harm tidal marshes or tidal flats should be allowed only for purposes that provide substantial public benefit and only if there is no feasible alternative...." The Bay Plan policies on tidal marshes and tidal flats further state that, "...Any proposed fill, diking or dredging project should be thoroughly evaluated to determine the effect of the project on tidal marshes and tidal flats, and designed to minimize, and if feasible, avoid any harmful effects...." The Bay Plan policies on mitigation state that, "Projects should be designed to avoid adverse environmental impacts to Bay natural resources...Whenever adverse impacts cannot be avoided, they should be minimized to the greatest extent practicable. Finally, measures to compensate for unavoidable adverse impacts to the natural resources of the Bay should be required...."

The Draft EIR states that a mitigation ratio of 2:1 would be implemented to offset adverse impacts of the initial tidal marsh vegetation removal along Alviso Slough. The Draft EIR also states that maintenance activities consisting of continued vegetation removal are anticipated to occur 3 to 5 times in a 10-year period, depending on the selected project alternative. It is likely that the Commission would require additional mitigation to reduce the impacts associated with the continued removal of tidal marsh vegetation associated with maintenance activities. BCDC-2

The Bay Plan policies go on to state that, "Any tidal marsh restoration project should include clear and specific long-term and short-term biological and physical goals, and success criteria and a monitoring program to assess the sustainability of the project. Design and evaluation of the project should include an analysis of: (a) the effects of sea level rise; (b) the impact of the project on the Bay's sediment budget; (c) localized sediment erosion and accretion; (d) the role of tidal flows; (e) potential invasive species introduction, spread and their control; (f) rates of colonization by vegetation; (g) the expected use of the site by fish, other aquatic organisms and wildlife; and (h) site characterization. If success criteria are not met, appropriate corrective measures should be taken...."

Potential restoration sites (e.g., Pond A6 and Pond A4) were identified in the Draft EIR as possible locations to mitigate the tidal marsh impacts of the project. Any restoration activities would likely need additional authorization by the Commission and would be required to be consistent with the Commission's policies on tidal marsh restoration.

Water Quality

The Bay Plan policies on Water Quality state that, "Bay water pollution should be prevented to the greatest extent feasible...." In the Draft EIR discussion of net methylmercury production and bioaccumulation in the food web (Pages 3.2-21 through 3.2-22), it states that project construction may result in short-duration exposure of sediments that potentially contain reactive mercury in the construction area and that use of a turbidity screen would limit the area of exposure and the sediments are expected to settle quickly. The Draft EIR goes on to state that deeper sediments that would be exposed during dredging activities could potentially contain high concentrations of mercury but that these sediments would not remain exposed as sediment deposition would occur during slack water and would cover these sediments. Lastly, the Draft BCDC-3

EIR states that the potential increase in methylmercury production are expected to be transient and offset by the reduction in methylmercury production resulting from removal of vegetation and root mass and the associated bacteria that induce methylation, thus the potential impact is considered less-than-significant.

Because the potential effects of methylmercury uptake on the food web are praticularly deleterious, more information is needed to support the finding that the potential effects of the project on increased mercury methylation would be less-than-significant. For example, how long would it take for the deeper sediments to become covered with sediment? How long would turbidity screens remain in place? Additionally, while the project would result in the removal of mercury-laden sediments (depending on the alternative selected), would the resuspension of deeper sediments that potentially contain higher concentrations of reactive mercury negate the beneficial effects associated with sediment removal? The Commission could potentially require a methyl mercury-monitoring project as a condition of the permit issued for the project to ensure that the potential impacts of the project on methylation are less than significant. Such a condition would also require provisions that would be required to be implemented if monitoring revealed that methylation rates were higher than anticipated. BCDC-3

Public Access

Section 66602 of the McAteer-Petris Act states that, "...existing public access to the shoreline and waters of the San Francisco Bay is inadequate and that maximum feasible public access to the Bay, consistent with a proposed project should be provided...."

The Draft EIR states that construction of the project would preclude the use of the levee top and the slough around the construction area during construction activities. Construction activities would range from 19 to 229 days depending on the selected alternative. The Draft EIR states that implementation of an alternate recreational trail route signage program would reduce the impacts of the project on recreation in the area. Because the closure to the levee access would be prolonged and in order to find the project consistent with the Commission's policies on public access, it is likely that the Commission would require additional public access to offset the temporary loss of public access at the site. BCDC-4

Thank you for providing staff with the opportunity to review and comment on the Draft EIR. If you have any questions regarding this letter or the Commission's laws and policies, please feel free to call me at (415) 352-3600, or by email at michellel@bcdc.ca.gov.

Sincerely,

MICHELLE BURT LEVENSON
Permit Analyst

ML/mm

cc: Doug Bloyd, 1414 Richards Avenue, San Jose, CA 95125

This page intentionally left blank.

Response to San Francisco Bay Conservation and Development Commission (BCDC)

BCDC-1: Comment noted. EIR Table 3.4-1, Applicable Plans and Policies, has been modified to indicate that BCDC's jurisdiction also extends to the two construction staging areas identified as 1) SCVWD; and 2) Pellegrini (as shown in Figure 2-7 of the EIR). As these sites are within the Commission's 100-foot shoreline band jurisdiction, it is acknowledged that a permit would be required for the project activities listed in the EIR (Final EIR page 3.10-5).

BCDC-2: Please refer to DFG-24 for explanation of mitigation. The EIR evaluates impacts and adequately identifies mitigation measures to reduce impacts to less than significant.

The effect of sea level rise (a) is discussed in Section 4.2.2 Cumulative Impacts of the EIR. The scale of the Project is small relative to the South San Francisco Bay and the Project is therefore not expected to have a significant effect on the sediment budget of the Bay (b). Localized sediment erosion and accretion (c) and the role of tidal flows (d) are addressed in Impacts HYD-1 and HYD-2, respectively, of EIR Chapter 3, Hydrology and Geomorphology.

The role of BCDC in the permit process and in the evaluation of the mitigation site is acknowledged EIR.

BCDC-3: Please refer to Master Response 2, Mercury Contamination and Bioaccumulation Effects on Aquatic and Terrestrial Organisms, and the revised section 3.2, Water and Sediment Quality.

BCDC-4: The proposed project is intended to promote additional long-term recreational use once the waterways are navigable and the slough has been widened. The EIR indicates that the project would have a temporary impact on trails in the project vicinity. Therefore, signage would be provided to indicate alternative trails. BCDC has indicated that because closure to the levee access would be prolonged (19-229 days, depending on the alternative selected), the Commission may require that additional access be provided to offset the temporary loss of public access to the site. Such mitigation measures may be necessary to find the project consistent with BCDC public access policies. These requirements would be addressed in the permit process once an alternative is selected.

This page intentionally left blank.

3. Regional, Counties, Cities

- San Francisco Bay Trail
- Santa Clara County Parks and Recreation Department
- City of San Jose

This page intentionally left blank.

SFBT

RECEIVED
JUL 23 2008
By

July 18, 2008

Michael F. Coleman
Environmental Planner
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

Subject: **Alviso Slough Restoration Project, Draft Environmental Impact Report**

Dear Mr. Coleman:

On behalf of the San Francisco Bay Trail Project, I am submitting comments on the Draft Environmental Impact Report for the Alviso Slough Restoration Project. The Bay Trail Project is a nonprofit organization administered by the Association of Bay Area Governments (ABAG) that coordinates the implementation of the Bay Trail. When complete, the Bay Trail will be a continuous 500-mile network that will encircle San Francisco and San Pablo bays in their entirety. It will link the shoreline of all nine Bay Area counties, 47 cities and connect to numerous public transportation systems. To date, over half the length of the proposed system has been developed. The Bay Trail not only provides recreation, but also serves as a commuter route for Bay Area bicyclists.

Alviso Marina County Park is a popular destination for pedestrians, birdwatchers and other outdoor enthusiasts who enjoy miles of shoreline trail around the marina with connections to the 9-mile Alviso Loop trail and Sunnyvale Baylands sections of trail. The proposed restoration project at the Alviso Slough is located immediately adjacent to the existing Bay Trail. One of the primary goals of the Bay Trail is to provide recreational, wildlife viewing and educational opportunities, and we support this proposed slough restoration effort to create more open water habitat to improve navigation and recreation. However, due to immediate proximity of the project site to the Bay Trail, conflicts might arise if not mitigated through design.

The EIR should address mitigations for potential impacts to the trail system including: SFBT-1

- temporary impacts like trail closures and detours during construction
- appropriate signage of trail closures and detours during construction
- increased machinery, haul truck traffic across the trail and in the trail vicinity potentially causing conflicts between trail users
- increased parking needs within the vicinity of the marina
- obstructed views of the bay from the Bay Trail
- connectivity of the trail north and south of the project
- restoring the trail to its original condition after project completion

Administered by the Association of Bay Area Governments
P.O. Box 2050 • Oakland California 94604-2050
Joseph P. Bort MetroCenter • 101 Eighth Street • Oakland California 94607-4756
Phone: 510-464-7935
Fax: 510-464-7970

We appreciate the specific mention of the Bay Trail Plan and the Plans and Policies section in the Alviso Slough Restoration Project Draft EIR but also recommend unifying and updating the language in the tables and text of the DEIR to state that the Bay Trail is a 500-mile network of bicycling and hiking trails with 300 miles complete. SFBT-2

Restoration of the Alviso Slough will improve tidal conditions, creating navigational opportunities and will likely increase bicycle and pedestrian use of the Bay Trail. Additionally, this project will also expand opportunities for the public to enjoy the beauty and cultural history of the Bay. SFBT-3

We appreciate the opportunity to comment on this project. Please feel free to call me at (510) 464-7919 with questions.

Sincerely,

P Bossak

Patrycja Bossak
Bay Trail Planner

cc: Michelle Burt Levenson, BCDC
Yves Zsutty, City of San Jose

Administered by the Association of Bay Area Governments
P.O. Box 2050 • Oakland California 94604-2050
Joseph P. Bort MetroCenter • 101 Eighth Street • Oakland California 94607-4756
Phone: 510-464-7935
Fax: 510-464-7970

Response to San Francisco Bay Trail (SFBT)

SFBT-1: As described in Impact REC-1, construction activities would not preclude parking and/or visitor use of the Alviso Marina County Park. In addition, mitigation measures for potential impacts to the trail system, during any temporary trail closures during construction, signage would be posted by the District "indicating an alternate route around the construction area. If construction occurs during the hunting season, additional signs would be posted near the construction site marking appropriate access and parking locations for hunters."

Potential impacts such as obstructed views are not anticipated. It should be noted that the segment of the San Francisco Bay Trail (SFBT) immediately adjacent to the Project area runs along the top of the District's flood protection levee. SFBT is to be assured that the Water District, as part of its ongoing levee inspection and maintenance, would restore the top of levee to its pre-project condition not only for trail use but for the integrity and stability of the levee as well.

SFBT-2: Comment noted. The Final EIR (pages 3.10-3 and 3.11-5) have been modified to include these changes.

SFBT-3: Comment noted.

This page intentionally left blank.

SCPRD1

County of Santa Clara

Parks and Recreation Department

298 Garden Hill Drive
Los Gatos, California 95032-7669
(408) 355-2200 FAX 355-2290
Reservations (408) 355-2201
www.parkhere.org

July 28, 2008

Michael F. Coleman, AICP
Project Manager/Environmental Planner
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

SUBJECT: Request for Extension on Comment Review Period for Draft Environmental Impact Report (DEIR) for the Alviso Slough Restoration Project – SCH#20070882071

Dear Mr. Coleman,

The Santa Clara County Parks and Recreation Department is in the process of reviewing the DEIR for the Alviso Slough Restoration Project. It is understood that the purpose of the Project is evaluate a range of alternatives for vegetation and root removal and dredging in Alviso Slough to meet a number of Project Objectives, including restoration of Alviso Slough's channel width to pre-1983 conditions, improve navigation and recreational boating access, and integrate the District's restoration actions with restoration projects proposed for the South Bay Salt Pond 8A.

The Santa Clara County Parks Department supports the objectives of this project as stated in the DEIR. As such, our primary responsibility, as stated in the Notice of Preparation, submitted September 11, 2007, is to ensure that the alternatives identified for the project are compatible with recreational facilities identified for implementation in the 1997 Alviso Marina County Park Master Plan and EIR, with specific emphasis on compatibility between the proposed actions of the Alviso Slough Restoration Project and the construction and operation of the Alviso Marina County Park Boat Launch Ramp.

The 1997 Alviso Marina County Park Master Plan identified a boat launch to be constructed in Alviso Slough to mitigate for the loss of launching opportunities due to siltation in the Alviso Marina basin. The 1997 EIR for the Alviso Marina County Park Master Plan identified preliminary design parameters for a launch ramp that would extend approximately 200' into Alviso Slough at its proposed location. Detailed design and construction of the boat launch ramp was deferred to Phase II of the park improvements and negotiations necessary for the acquisition needed to implement this component of the Master Plan were begun. Development of Construction Documents began in Fall 2007. Currently, the County Parks Department is reviewing a 30% completion submittal of the Construction Documents for the boat launch ramp and all associated park improvements.

SCPRD-1

All cross section information provided in the DEIR referenced elevations at the South Bay Yacht Club, located approximately 1000' upstream from the proposed Alviso Marina County Park boat launch ramp. It is therefore unclear if the DEIR has been able to effectively evaluate the impact that any of the proposed project alternatives will have on the construction, operation, and continued maintenance of the

Board of Supervisors: Donald F. Gage, Blanca Alvarado, Peter McHugh, Ken Yeager, Liz Kniss
County Executive: Peter Kutras, Jr.

SCPRD-1

County's boat launch ramp. Based upon the need to obtain a copy of the Engineer's Report for the Alviso Slough Restoration Project, County Parks requests a time extension to August 15, 2008 in which to comment on this project so as to acquire a copy of the Engineer's Report, to review it with our engineering consultants, and confer with the Water District engineers, if necessary. We believe that this additional time is necessary so as to achieve compatibility between the Water District's and the Park's project and meet one of the DEIR's primary project objectives to "Improve the Community's ability to purse navigation, public access, and aesthetics to allow for the expansion of boating and other recreational opportunities" in the Alviso Slough.

SCPRD-2

Please forward a printed or electronic copy of the Engineer's Report to the attention of Jane Mark at Jane.Mark@prk.sccgov.org. If you have any questions, please contact me by phone at (408)355-2236.

Sincerely,

Elish Ryan
Park Planner

Cc: Julie Mark, Deputy Director
Jane Mark, Senior Planner
Mark Frederick, Construction Services Manager
EIR Tracking File No. 261

Board of Supervisors: Donald F. Gage, Blanca Alvarado, Peter McHugh, Ken Yeager, Liz Kniss
County Executive: Peter Kutras, Jr.

Response to Santa Clara Parks and Recreation Department, letter 1 (SCPDR1)

SCPRD1-1: Comment noted. The District granted this time extension.

SCPRD1-2: Comment noted. The District granted this time extension.

This page intentionally left blank.

SCPRD2

County of Santa Clara
Parks and Recreation Department

298 Garden Hill Drive
Los Gatos, California 95032-7669
(408) 355-2200 FAX 355-2290
Reservations (408) 355-2201
www.parkhere.org

1850

August 15, 2008

Michael F. Coleman, AICP
Project Manager/Environmental Planner
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

SUBJECT: Comments to the Draft Environmental Impact Report (DEIR) for the Alviso Slough Restoration Project – SCH#20070882071

Dear Mr. Coleman,

The Santa Clara County Parks and Recreation Department (County Parks) has reviewed the DEIR for the Alviso Slough Restoration Project. It is understood that the purpose of the Project is to evaluate a range of alternatives for vegetation removal and dredging in Alviso Slough to meet a number of objectives, including restoration of Alviso Slough's channel width to pre-1983 conditions, improvement of navigation and recreational boating access, and integration of the District's restoration actions with the South Bay Salt Pond (SBSP) restoration project for Pond 8A. It is also understood that the Project's Alternative No. 5 is both the staff-recommended and the community-supported alternative.

Compatibility of Project Alternatives with the approved Alviso Marina County Park Master Plan

As stated in County Parks response to the Notice of Preparation for the DEIR, submitted September 11, 2007, our primary responsibility is to ensure that the alternatives identified for the project are compatible with recreational facilities identified for implementation in the approved 1997 Alviso Marina County Park Master Plan, with specific emphasis on compatibility between the proposed Alviso Slough Restoration Project and the construction of the new Alviso Marina County Park Boat Launch Ramp. Alternative No. 4 or No. 5 appear to be the alternatives that meet the Project objectives and are most likely to be compatible with the County's plans to construct a boat launch downstream form the Project area. SCPRD2-1

As background, in 1997, a Master Plan for Alviso Marina County Park was approved which identified a boat launch ramp to be constructed in Alviso Slough to mitigate for the loss of launching capacity due to siltation in the defunct Alviso Marina basin. The EIR for the 1997 Alviso Marina County Park Master Plan identified preliminary design parameters for a launch ramp that would extend approximately 200' into Alviso Slough at its proposed location. Detailed design and construction of the boat launch ramp was deferred to Phase II of the park improvements and negotiations necessary for the acquisition needed to implement this component of the Master Plan were begun.

Compatibility of Alternatives with Alviso County Park Boat Launch Ramp Design SCPRD2-2

Design of Phase II Alviso County Park improvements began in 2007. Currently, County Parks'

Board of Supervisors: Donald F. Gage, Blanca Alvarado, Peter McHugh, Ken Yeager, Liz Kniss
County Executive: Peter Kutras, Jr.

engineering consultants have released a 30% completion submittal of the construction documents for the launch ramp and all associated park improvements. As part of the detailed design work, the lower end of the launch ramp has been determined to be -9.4 feet NGVD29 to comply with acceptable boating standards. A copy of the 30% submittal is attached for reference. Again, Alternative No. 4 or No. 5 appear to be the alternatives that meet the Project objectives. However, it is not clear if the effective lifespan of the Project before the need to redredge has been adequately identified or if the extent of impacts as a result ongoing maintenance of either alternative would have on potential scouring or sedimentation at the proposed boat launch. It is anticipated that the County Parks' Construction Services Division will forward a copy of the construction documents at 60% completion for the District's review and comment in early September 2008. The County is looking forward to coordinating further with the District to ensure that design parameters of both the District and the County Park's projects, in their respective footprints, work together to meet both agency's goals and minimize future sedimentation in the channel. SCPRD2-2

Compatibility with existing Alviso County Park Facilities

At this time, the DEIR states that no construction access or staging will occur on any lands under the operation of County Parks in the vicinity of Alviso County Park. Should revisions to any of the Project Alternatives require use of County Parks property for accessing or staging, the District is asked to notify County Parks to conduct an analysis of impacts and coordinate potential mitigations to County Parks facilities. SCPRD2-3

Thank you for the opportunity to review the DEIR for the Alviso Slough Restoration Project. If you have any questions, please contact me at elish.ryan@prk.sccgov.org or by phone at (408)355-2236.

Sincerely,

Elish Ryan
Planner III

Attachments: Alviso County Park Boat Launch 30% submittal for Construction Docs.

Cc: Julie Mark, Deputy Director
Jane Mark, Senior Planner
Mark Frederick, Capital Projects Program Manager
EIR Tracking File No. 261

Response to County of Santa Clara Parks and Recreation Department, letter 2 (SCPRD2)

SCPRD2-1: Comment noted.

SCPRD2-2: Comment noted.

SCPRD2-3: Comment noted.

This page intentionally left blank.

SJ

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Department of Planning, Building and Code Enforcement
JOSEPH HORWEDEL, DIRECTOR

July 24, 2008

Mr. Michael Coleman, Environmental Planner
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

SUBJECT: DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE ALVISO SLOUGH RESTORATION PROJECT (OA08-019)

Dear Mr. Coleman:

On June 16, 2008, the City of San Jose received a Notice of Availability of a Draft Environmental Impact Report (EIR) for the Alviso Slough Restoration Project from the Santa Clara Valley Water District. The Draft EIR was prepared to evaluate environmental impacts of the proposed project alternatives. The project is focused on restoration of the Alviso Slough channel width and depth between the Gold Street Bridge and the County Marina to achieve the following objectives:

- Restore the channel width and habitat to pre-1983 conditions,
- Improve navigation, public access and aesthetics to allow for the expansion of boating and other recreation/tourism opportunities, and
- Integrate with the federal South Bay Salt Pond Restoration Program to improve salt water flows to the Lower Guadalupe River.

The City of San Jose appreciates the opportunity to review and provide comments on the Draft EIR and offers the following comments.

Section 1.4 Related Local Projects.
The EIR should reference a City of San Jose project. The City's Parks, Recreation and Neighborhood Services Department has completed a master plan for the Bay Trail with planned trails along the boundary of the project. The 2002 Plan indicates Reaches 7 and 9 along the Alviso Slough.

The City has conducted property surveys to support development of an interim trail alignment along Reach 7 (from County Marina Park to near the UPRR railway, along the existing gravel maintenance road that runs in front of the SBYC). Plat and Legal Descriptions have been prepared for several properties and the City is seeking funds to proceed with negotiations with several property owners to secure recreational easements. SJ-1

The City has completed a Feasibility Study and Geotechnical Study for construction of a 540' pedestrian bridge that is intended to span the slough, running parallel to, and west of the Gold Street and UPRR Railway bridges. Construction documents for the project are being prepared at this time. The documents define the bridge and also three under-crossing structures beneath the future bridge, UPRR Railway and Gold Street bridges. A rendering of the bridge and the associated studies can be found on the Trail Program web site at www.sjparks.org/trails > Trail Systems > Bay Trail. Please contact Yves Zsutty, Trail Program Manager for further questions at (408) 793-5561. SJ-1

Changes to the width of the slough may have serious impacts to the planned trails and bridge project. The EIR should acknowledge the past planning work and current design work and ensure that projects are well coordinated.

The Lower Guadalupe River Trail uses the existing gravel maintenance roads and terminates at Gold Street. Although just outside of the project area, it should be noted that this trail system is a nearby source of recreational users and that maintenance of the slough should take into account this pedestrian and bicycle traffic. SJ-2

Page 3.11-5 acknowledges the future pedestrian bridge. But as noted previously, it does not appear in the table of related documents. SJ-3

Page 3.11-7 references the "Alviso Levee Trail." This is the same as the Reach 7 Trail noted in the Bay Trail. Please clarify that the recent improvements noted were installed by the Santa Clara Valley Water District and not the City of San Jose. SJ-4

Page 3.11-9 discusses potential closure of trails on a temporary basis. If trails are being operated by the City of San Jose, all closures must follow the Council adopted policy on trail closure noticing, which should be mentioned in the EIR. Please coordinate with the Trail Program Manager for any planned closures to City Trails – and refer to the Trails web site above for guidance on the Trails Closure policy. SJ-5

Figure 3.11-1 should not show a trail crossing the railway tracks. This alignment was deemed infeasible and is justification for the planned pedestrian bridge that will permit trail users to avoid a railway crossing. SJ-6

Figures 2.2, 2.3, 2.4, 2.5 and 2.6 should indicate the pedestrian bridge that is being designed at this time as well as the trail alignments along the project. SJ-7

A private developer has secured permits from the City's Planning Department for a private recreational club along the south bank of the slough, west of the UPRR Railway alignment and upon the Legacy Development site. Reach 9 of the Bay Trail is planned along this frontage. The substantial work proposed by Alternative 5 should ensure that both projects as planned will still be viable. SJ-8

The EIR should indicate a negative impact on public access for recreation that would occur along the existing Reach 7 and future Reach 9 trails (should Reach 9 be built before the proposed Project build out) as defined by the Bay Trail Master Plan. Temporary closure of existing trails will need to be coordinated with the City of San Jose as stated above. SJ-9

Table 3.11-1 should reference the Feasibility Study and Geotechnical Study prepared for the Bay Trail Reach 9B Pedestrian Bridge. The Table reports that the Bay Trail Master Plan defines the trail system as undeveloped – which is true. But the table should make it clear that the City is actively working on development of Reaches 7 and 9 at this time. SJ-10

Thank you again for the opportunity to comment on the Draft EIR for this important project. We look forward to reviewing the Final EIR when it becomes available for review. Please provide me with a hard copy, web link or CD version of the complete Final EIR, including all technical reports/volumes of the document when it becomes available. You may send the document directly to my attention. If you have any questions about these comments or need additional information, please contact me at (408) 535-7815 or by email at Janis.moore@sanjoseca.gov. SJ-11

Sincerely,

Janis Moore
Planner II

c: Yves Zsutty, PRNS

OA08-019 DEIR Alviso Slough RestorationPjct Ltr.doc/JAM

This page intentionally left blank.

Response to San Jose Department of Planning (SJ)

SJ-1: Section 1.4 of the Final EIR (page 1-12) has been modified to include the description of Reaches 7 and 9, and that coordination of between these projects would be necessary. These projects are also already identified in EIR Table 4-3 Cumulative Recreation Projects and in Table 3.11-1 (Recreation) Applicable Plans and Policies.

SJ-2: Comment noted. The Final EIR includes a reference to the Lower Guadalupe Trail (page 3.11-6) and additional information provided in comment SJ-2 has been added to this section.

SJ-3: Section 3.11 Recreation (Table 3.11-1) in the EIR has been revised to include a reference to the future pedestrian bridge.

SJ-4: Comment noted. Section 3.11.2 of the EIR has been modified (Final EIR page 3.11-8).

SJ-5: Comment noted. Section 3.11.3 of the Final EIR (page 3.11-10) has been modified to include information regarding trail closures within the City of San Jose's jurisdiction. In addition Mitigation Measure REC-A (Final EIR page 3.11-10) has been revised to require coordination with the City's Trail Program Manager prior to any trail closures.

SJ-6: Figure 3.11-1 illustrates the three undercrossings for the proposed Bay Trail: one at the proposed pedestrian bridge, one at the UPRR Bridge and one at the Gold Street Bridge.

SJ-7: Please refer to the response to SJ-1. The pedestrian bridge is appropriately shown in Figure 3.11-1 pertaining to recreation features.

SJ-8: Please refer to the response to SJ-1.

SJ-9: As described in Impact REC-1, construction-related activity in and around Alviso Slough (for all alternatives) would not preclude use of the Bay Trail (existing and proposed portions). The text of the mitigation for Impact REC-1 (REC-A on Final EIR page 3.11-10) has been modified to include coordination with the City of San Jose.

SJ-10: Comment noted. EIR Table 3.11-1 has been modified to indicate that the City of San Jose is actively working on development of Reaches 7 and 9.

SJ-11: Comment noted

This page intentionally left blank.

4. Organizations and Individuals

- Santa Clara Valley Audubon Society
- Citizens Committee to Complete the Refuge
- Libby Lucas
- Diana Foss
- Robert W. Gross, Ph.D.
- Russ Robinson

This page intentionally left blank.

SCVAS

Santa Clara Valley Audubon Society
Founded 1926

July 21st, 2008

Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118
ATTN: Mike Coleman, Project Manager
Alviso Slough Restoration Project

Dear Mr. Coleman:

The following are comments by the Santa Clara Valley Audubon Society (SCVAS) on the Draft Environmental Impact Report (dEIR) for the proposed Alviso Slough Restoration Project (ASRP). SCVAS has nearly 3,700 members in Santa Clara County and our mission is as follows: "To preserve, to enjoy, to restore and to foster public awareness of native birds and their ecosystems, mainly in Santa Clara County."

Our members typically share a passion for wildlife and natural resources, especially birds. Many of our members regularly enjoy the scenic and natural resource values of the Alviso area, including but not limited to the Alviso Marina and the lands surrounding the Don Edwards NWR Education Center. We have both scientific and recreational reasons to be concerned with developments in this area.

Executive Summary: We believe the following questions need to be answered before any of the alternatives are approved by the Board.

- Finance: A thorough analysis of each of the alternatives needs to be done as to what existing programs would need to be curtailed or permanently cut in order to pay for on-going maintenance costs associated with each alternative. SCVAS-1
- Mitigation: What will be the tidal marsh mitigation for each of the alternatives. We're looking for specific mitigation measures associated with each alternative, not a list of theoretical mitigation measures. SCVAS-2

For reasons elaborated below, we recommend that this dEIR not be approved at this point, and that the Board delay a decision until such time that the Board and the public can be apprised of the long-term financial impact this project will have on District operations. SCVAS-3

Finance

Whether this is a dEIR question or an operational question, the fact remains that the engineer's report brings up the potential long-term impact on maintenance activities should the staff recommended alternative be adopted: SCVAS-4

> *"For long-term maintenance of the completed project, approximately $3.6M would have to be set aside annually from property tax revenues to fund ongoing removal of re-emerging vegetation and periodic dredging of the slough channel to maintain post-project*

22221 McClellan Road, Cupertino, CA 95014 * Phone: (408) 252-3747 * Fax: (408) 252-2850
email: scvas@scvas.org * www.scvas.org

> *conditions. This is a conservative estimate; if the proposed Pond A8 Phase 1 Action is implemented and operated successfully, the long-term maintenance costs for the Alviso Slough Restoration Project would be reduced. The current annual property tax revenues closely match the existing annual operations and maintenance program in all the watersheds of the county; thus, some programs would be curtailed, and others permanently cut, to set aside the necessary monies for post-project O&M work."*

Although this issue was clearly identified in the Engineers Report, the dEIR inadequately discusses exactly what programs would be curtailed and/or permanently cut. There is no way for the public or the Board to determine if there could be a serious environmental impact resulting from curtailed programs or permanently cut existing programs. Until there is an analysis of the impact of each alternative on existing maintenance programs, we have to recommend that the Board take no action on this project or any of its alternatives other than the no-project Alternative. SCVAS-4

Mitigation for Loss of Tidal Marsh

Mitigation Measure TERRBIO-B sets the standard for 2:1 replacement ratio for loss of tidal wetland habitat. The paragraphs explaining this measure discuss all of the possible ways this mitigation could be carried out. None of the language discusses actual agreement on how this mitigation will be carried out. SCVAS-5

As background, SCVAS has been working on the issue of mitigation monitoring with the City of San Jose, the City of Morgan Hill, and Santa Clara County for some time, with varying levels of effort. The basic issue is whether the mitigations committed to when a project is approved will in fact be fulfilled. SCVAS has found that in many cases such mitigation commitments are often broken, and thus natural resources are lost.

1. As an overarching mitigation measure, we suggest that—if this project goes forward—one or more staff members be specifically designated as coordinator(s) for the mitigation measures contained in the dEIR and eventual Mitigation Monitoring coordination (we understand these staff members would change over time). If this were done, District staff and members of the public would know who to go to with questions or complaints, helping assure better monitoring.
2. Again, as a mitigation measure, we request that all mitigation measures be tracked and posted electronically to the web. An example of this with a large-scale project can been seen in San Francisco with the Mission Bay development. The URL is below. http://www.rbfconsulting.com/catellus/measures.asp SCVAS-6
3. As an overarching mitigation measure, we request that there be a single Mitigation Monitoring Report that tracks mitigation measures associated with the ASRP. This document should be done at least annually, and compare the original requirements with what has actually been accomplished. The document and supporting materials should be public records easily accessible from the District.
4. The Mitigation Monitoring and Reporting Program in chapter 5, outlines several scenarios of what the district will do regarding replacement of tidal wetland. These scenarios take on an if/then format. We recommend that District staff identify the single strategy the District will pursue and make that explicit as part of the dEIR. SCVAS-7

Mitigation for disturbance of sensitive animal species

The mitigation for sensitive animal species identifies a 6-month construction window from September 1st to February 28th. Please identify the possible circumstances that would cause construction to shift outside of this window. Effective location of breeding Saltmarsh Common Yellowthroat and Alameda Song Sparrow is not a realistic mitigation should construction be shifted into the breeding season. SCVAS-8

Flood Control

We must also comment that we were struck by the over-whelming and misunderstood public support of this project as a "flood control" project. This project is not a flood control project, and this is clearly pointed out in the engineer's report, P. ES-3:

> *"The proposed project work would have a significant impact on existing flood protection for the Alviso community... To mitigate for this impact, the staff-recommended alternative would include lowering the Pond A8 weir (Fig. ES-1) between 1 and 2 feet."*

We urge the District staff to ensure the flood control aspects of this project are clearly communicated to the general public. SCVAS-9

We applaud the proposed removal of abandoned vessels and navigational hazards currently on-site and recognize the positive impact the project may have on recreational uses of Alviso Slough, should it be approved by the Board. We may be able to support one of the proposed alternatives once we understand more clearly the financial impact of each alternative on overall District operations. Please keep SCVAS informed of the progress of the dEIR as it moves forward. Our contact information is on the letterhead of this document. We look forward to remaining engaged on this vital issue. SCVAS-10

Sincerely,

Bob Power, Executive Director

22221 McClellan Road, Cupertino, CA 95014 * Phone: (408) 252-3747 * Fax: (408) 252-2850
email: scvas@scvas.org * www.scvas.org

This page intentionally left blank.

Response to Santa Clara Valley Audubon Society (SCVAS)

SCVAS-1: Comment noted. It is important to note that certification of the EIR is based on CEQA requirements for adequacy. The financial analysis of each alternative, including an assessment of which existing District programs would need to be curtailed or permanently cut, is an action separate from EIR Certification. While financial analysis is not required under CEQA, the District's Board of Directors will consider costs prior to making any decisions to approve a project.

SCVAS-2: Please refer to DFG-24 for explanation of mitigation. During the permitting process, regulatory agencies may require their own mitigation ratios based on their findings. The final details are determined during the permitting phase for the selected alternative, and cannot be determined at this time.

SCVAS-3: Comment noted. Please also refer to SCVAS-1.

SCVAS-4: Please refer to SCVAS-1.

SCVAS-5: Please refer to response comment SCVAS-2. Please refer to DFG-24 for explanation of mitigation and RWQCB-11 for an explanation of the level of detail provided in Mitigation Measure TERRBIO-B.

SCVAS-6: Comment noted. The final requirements will be determined during the permitting phase for the selected alternative.

The District implements and tracks its mitigation commitments consistent with CEQA Guidelines Section 15097 - Mitigation Monitoring and Reporting via specific policies, procedures and guidelines. These are implemented through its ISO 14001 certified Environmental Management System (EMS). The system specifies monitoring, reporting and compliance for internally driven CEQA commitments and external regulatory requirements through its Regulatory Compliance Process and Permit Management System to ensure that such obligations are fulfilled.

SCVAS-7: Please refer to response DFG-24, SCVAS-2, and RWQCB-11.

SCVAS-8: Please refer to Master Response 1, Construction Windows, for a discussion of how the construction timing relates to the critical periods for various sensitive species.

SCVAS-9: Comment noted. District fully agrees with SCVAS's observation.

SCVAS-10: Comment noted regarding support for removal of abandoned vessels, navigational hazards currently on-site, and the positive impact that the project may have on recreational uses of Alviso Slough.

This page intentionally left blank.

CCCR

CITIZENS COMMITTEE TO COMPLETE THE REFUGE

453 Tennessee Lane, Palo Alto, CA 94306 Tel 650 493-5540 Fax 650 494-7640 www.CCCRRefuge.org

July 28, 2008

Michael F. Coleman
Environmental Planner
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118-3686

RE: Alviso Slough Restoration Project

Dear Mr. Coleman:

The Citizens Committee to Complete the Refuge thanks you for the opportunity to comment on the draft Environmental Impact Report (DEIR) describing the proposed Alviso Slough Restoration Project (Project). We appreciate also your consideration of these comments as contributions to the best environmental outcomes on behalf of our Bay's wetlands and shoreline.

After conscientious review, we strongly recommend that the Santa Clara Valley Water District identify Alternative 6, No Project, as the preferred alternative in the Final Environmental Impact Report (FEIR). CCCR-1

We find there is a substantial environmental and regulatory basis for this recommendation. In our review of the draft document we note that certain important factors were overlooked in its preparation. We present them here:

1. National Wildlife Refuge System Administrative Act of 1966 and its Amendments (NWRSAA)

The NWRSAA is the federal organic law establishing wildlife conservation requirements and jurisdiction of public lands and waters held as National Wildlife Refuges. Such is the status of the land that is this Project's major neighbor, the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge). In the DEIR this law was omitted as a regulatory factor of the US Fish and Wildlife Service (US FWS) (pp ES-3, 1-9). CCCR-2

The NWRSAA establishes that Refuge management must take action to protect wildlife and the environmental health of habitats that are within Refuge borders.

All but the No Project Alternative propose changes that will impact conditions on the Refuge. Each have a hydrological requirement to lower the levee weir that allows flood waters to escape the slough channel onto the Refuge location known as Pond A8 and, through it, onto Refuge Ponds A5, A7 and possibly A6. CCCR-3

The DEIR presumes by this omission that the Santa Clara Valley Water District (District) has rights to alter the weir at will. When the Refuge acquired the ponds mentioned in 2003, the current weir was an existing easement and condition that had been negotiated by the District with the prior landowner. The DEIR proposes to alter those conditions in all but the No Project Alternative. Thus any alteration of the weir involving impact on the Refuge must reassess District rights to do so and US FWS responsibility under the NWRSAA. CCCR-3

It should be noted as well that the downstream topping of levees along ponds A12 and All, a potential outcome mitigated by lowering the weir, would also introduce greater flow of flood waters onto Refuge lands and increase the potential of harm to wildlife and habitats. Thus, with or without lowering the weir, Alternatives 1 through 5 involve the NWRSAA. CCCR-4

2. Floodwater Pond A8 Input volume and frequency changes produced by lowering the weir

As all alternatives except Alternative 6 require lowering of the Pond A8 weir, the water flow changes resulting must be more thoroughly considered in the FEIR.

Lowering the weir would appear to have two potential effects on the disbursion of floodwaters through the weir. One is to mitigate the impact of wave action introduced to slough dynamics by changes required in Alternatives 1-5. The second is to increase the frequency of floodwater input events on Pond A8 by reducing the floodwater threshold of the weir. CCCR-5

The FEIR needs to assess these changes by estimating the input volume onto Pond A8 at current weir height and at the 0.5, 1.0, and 2.0 foot heights proposed in Alternatives 1-5. It also needs to present a frequency projection for floodwater input events for both current and proposed heights already mentioned.

Such studies need to be published as a supplementary DEIR document and distributed for comment prior to determination of Project FEIR conclusions.

3. Mercury

We would like to express our appreciation to the District for its attention to the mercury issue as a whole and for consideration of impact on the wildlife food web and on people. There is, however, an omission in the DEIR regarding mercury. It did not discuss the potential for conveyance of mercury nor other pollutants including trash onto the Refuge during storm events.

When acquiring Pond A8 and nearby former salt ponds, the Refuge recognized that there were known, historical deposits of mercury within pond boundaries. That status became a factor of significant importance in restoration planning and implementation. Given that fact, Refuge planning must include avoidance of any increase in mercury deposition. CCCR-6

The DEIR discussion of mercury pollution (p. 3.2-5) states that discharge of mercury into the watershed is episodic i.e. mostly occurring during high-flow storm events. It does not correlate such events with a lowered weir nor the impact of altered input onto the Refuge.

It is anticipated that implementation the Guadalupe River Watershed TMDL will eventually reduce the watershed disbursion of mercury to insignificant levels. It is expected that that outcome is some years in the future, possibly decades. Thus the intervening years have the potential for significant mercury deposition onto the Refuge during high-water storm events.

It is a concern that the DEIR, in discussing methylmercury production and bioaccumulation (pp 3.2-21, 3.2-22), can conclude as a summary of all Alternatives that the Project would have "Less than

Significant" impacts on this pollutant issue. In the same section the DEIR acknowledges that bringing deeper sediments to the surface could increase the reactive mercury in those sediments and that "It is not known for certain that this increase in reactive mercury would result in an increase in the methylation rate." With such an unknown, a less than significant impact is fully inappropriate.

We can only conclude that Alternatives 1-5 will increase the extent of mercury pollution possible on the Refuge, through a lowered weir, and possibly downstream of the Project site. Doing so would increase risks to the food web and impacted species above and beyond risk levels that already exist. This is an unacceptable change and must be addressed in the FEIR.

CCCR-6

4. South Bay Salt Pond Restoration Project (SBSPRP)

It is disturbing that the DEIR proposes actions that preemptively impose landscape changes adjacent to the SBSPRP, actions that would alter wetland conditions that are the basis for that project's Final Environmental Impact Report and on objectives that deliver desired benefits to Alviso Slough. Indeed, the project elements that benefit the Alviso Slough area may better inform the degree to which additional measures may or may not be required for the Project area involved and also in areas upstream, downstream or adjacent to the SBSPRP.

As the SBSPRP timeline is approaching its Record of Decision and authorization for Phase I implementation, the relative timeline position of any Alviso Slough project should be complementary and supportive in any direct or indirect impact.

As Alternatives 1-5 all propose to impact the SBSPRP on Refuge land through increased potential of floodwater input, it is clear that those proposals are neither complementary nor supportive.

To date, the District has been a strong partner to the SBSPRP for planning, Interim Stewardship Plan implementation and commitment of funds. As such, any decision authorizing Alternatives 1-5 would be contradictory to those major District actions. As Alternative 6 sustains existing conditions, it alone among the Alternatives is complementary and supportive of the SBSPRP.

CCCR-7

5. South Bay Shoreline Study (Shoreline Study)

We note here that the DEIR, under Related Local Projects (pp 1-9 to 1-11), omits the Shoreline Study. We believe this is an omission that needs to be corrected in the FEIR. This is another project that will have major impact on the Alviso Slough.

As the District is the lead local partner to the Army Corps of Engineers on the Shoreline Study, it is surprising that the project was not listed with suitable descriptions directly related to the Alviso Slough. While the Study's timeline has yet to be set, its purpose and process will certainly provide extensive new information for regional and localized planning. As the DEIR includes ample discussion of maintenance required in Alternatives 1-5, it is an omission to not also discuss the potential of the Shoreline Study process to contribute guidance on flood maintenance topics.

CCCR-8

6. Mitigation

Impacts on the Refuge that we have introduced here would by necessity require mitigation if one of the actionable alternatives is finally recommended. In such discussion, the FEIR needs to provide mitigation measures that offset adverse biological impacts introduced by altered hydrological and

CCCR-9

pollutant conditions to the Refuge and to federally-listed species. Such mitigation proposals must identify specific remedies and be published for comment prior to final decisions of the FEIR.

Similarly we find descriptions of mitigation actions already included in the DEIR to be insufficient, lacking specificity and identity that definitively present remedies. The FEIR will need much improved mitigation discussion throughout.

CCCR-9

7. Project description and goals identifying the Project as *not* for flood control

In its objectives, the DEIR states: "Maintain one percent flood protection in Alviso Slough." In public presentation District staff has stated that this is *not* a flood control project. But such statements are contradicted by actions proposed by Alternatives 1-5. Each proposes action that creates new flood dangers that must be mitigated in new flood control actions. Making matters worse, the proposed flood control actions dramatically increase Project costs and divert funds that could be used otherwise e.g. for watershed projects that may be alternatives that reduce flood potential without aggravating existing flood conditions.

As all of the Project's actionable alternatives require new flood control implementation, it is incorrectly described when not identified as a flood control project. Its flood control actions need to be evaluated in that context.

CCCR-10

In general, for Alternatives 1-5, we have grave concern on behalf of the Refuge, wildlife and the environmental health of our wetlands regarding wildlife and habitat disruption introduced by construction and extended over years of maintenance. It is disconcerting too to see that a solution for mercury-loaded dredged sediment is to transport it to a landfill on a site subject to seismic liquefaction. It is a concern, again and again, that this project is even being considered at a time when other already approved projects provide such great prospects for like benefits without the additional costs cited in this DEIR.

CCCR-11

In summary, we believe that issues discussed herein should be part of the FEIR and, if that is done, will lead to the conclusion that the final recommendation should be Alternative 6, No Project.

CCCR-12

Yours truly,

Florence LaRiviere

Florence M. LaRiviere
Chairperson

Eileen P McLaughlin

Eileen P. McLaughlin
Shoreline Watch for San Jose

CC: Regional Water Quality Control Board
Don Edwards San Francisco Bay National Wildlife Refuge
US FWS Ecological Services Division
Santa Clara Valley Audubon Society
California Native Plant Society

Response to Citizen's Committee to Complete the Refuge (CCCR)

CCCR-1: Comment noted.

CCCR-2: The appropriate information on the National Wildlife Refuge System Administrative Act of 1966 and its Amendments was added to the Final EIR Table 3.4-1 (page 3.4-2), Applicable Plans and Policies.

CCCR-3: As stated in the response to Comment USFWS-6, the District owns the A8 weir and adjacent lands in fee title. Please refer to Master Response 4 which addresses the potential for flooding associated with lowering of the weir.

CCCR-4: Comment noted. See also CCCR-2.

CCCR-5: Please refer to Master Response 4.

CCCR-6: Please refer to Master Response 2, Mercury Contamination and Bioaccumulation Effects on Aquatic and Terrestrial Organisms and the revised Section 3.2, Water and Sediment Quality. In addition, the conveyance of pollutants such as trash is discussed in Section 3.2, more specifically under Impact WQ-5.

CCCR-7: Please refer to Master Response 4 for a discussion of floodwater input to Refuge land, and Response to Comment RWQCB-14 for a discussion of the relative timing of the Alviso Slough Restoration Project and the SBSP Restoration Project.

CCCR-8: The Shoreline Study is discussed in the EIR under Growth Inducement and Cumulative Analysis (page 4-10 of the Final EIR). This information is also relevant to Chapter 1; therefore, Chapter 1 of the Final EIR (page 1-12) has been amended to include information about the Shoreline Study.

CCCR-9: In the Biological Resources sections (aquatic and terrestrial), the EIR identifies significance thresholds or criteria that are used to determine the biological impacts and levels of significance. Affected special status species are identified in Tables 3.3-8 and 3.4-4 of the Final EIR. Mitigation Measures AQBIO-A, Maintain Minimum 20-foot Marsh Buffers Along Upland Margins of Alviso Slough; AQBIO-B (Evaluate and Monitor Macroinvertebrate Community Response to Disturbance and Deliver Bi-Annual Reports during and after Initial Construction to the District, NMFS, and other Applicable Resource Agencies for a Period of 3 years Following Initial Construction); TERRBIO-A (Construction timing to avoid breeding seasons); TERRBIO-B (2:1 replacement of tidal wetland habitat); TERRBIO-C (Avoid western snowy plover breeding season); HYD-A (Lower Pond A8 weir); and WQ-B (Choose methods of dredging that minimize dispersion of suspended) would adequately reduce potential impacts (associated with both initial construction and reoccurring maintenance activities) to less than significant. Impacts that cannot be mitigated to less than significant would be considered significant and unavoidable. Impacts AQBIO-3 (for Alternatives 1-5), AQBIO-4 (for Alternatives 2-5), TERRBIO-15 (Alternatives 1-5) are identified in the Final EIR as Significant and cannot be mitigated to a level that is less than significant.

CCCR-10: Although the project objectives include the statement "*maintain* one percent flood protection in Alviso Slough, it is not intended to be a statement that the project is a flood protection project. It should be noted that page 1-4 of the Draft EIR discusses that the LGRP already provides one-percent flood protection from overbank flooding from I-280 in San Jose to the Alviso Marina County Park. Therefore, the proposed project is intended only to maintain the current level of flood protection and is not to be considered a "flood control project".

CCCR-11: Comment noted.

CCCR-12: Comment noted.

LL1

Libby Lucas 7_9_08.txt

From: JLucas1099@aol.com [mailto:JLucas1099@aol.com]
Sent: Wednesday, July 09, 2008 1:01 PM
To: Mike Coleman
Subject: Alviso Slough Restoration Project - DEIR and Draft Engineer's Report - May 2008

Michael F. Coleman, Environmental Planner
July 9, 2008

Santa Clara Valley Water District

5750 Almaden Expressway

San Jose, CA 95118

Dear Michael Coleman,

Re Santa Clara Valley Water District's Alviso Slough Restoration Project, DEIR and Draft Engineer's Report, I would like to submit preliminary comments for consideration before the public hearing on July 16 in Alviso.

~ In consideration of the extensive amount of vegetation and root mass removal from Alviso Slough proposed in all five alternatives to restoration project, there appears to be a deficiency in slough habitat revegetation or mitigation for habitat loss. Past Santa Clara Valley Water District maintenance protocols have conducted channel vegetation removal on alternate sides of waterways in order to maintain habitat for resident species. If such a best management practice is not a viable consideration for this project then appropriate mitigation for wetlands and riparian vegetation habitat loss is needed. LL1-1

~ Target vegetation of pickleweed, salt grass and alkali heath might be consideration for terraces in tidal zone with disturbed upland slopes seeded with California brome, molate fescue and meadow barley (salt) for erosion control. LL1-2

~ There is mention that "maintenance permits require a minimum 20-foot wide fringe of marsh along the low flow channel so as to protect habitat this marsh growth provides there" in Guadalupe River above Gold Street Bridge. This low flow channel fringe of marsh needs to be incorporated into present proposed project design.

LL1-3

~ Then on upper levee at least 25 feet depth of vegetation is warranted simply from standpoint of non-point source pollution protection of the waterway. In consideration of the proximity of recreation use, 40 to 50 feet of upland vegetation for appropriate wildlife habitat protection and continuity of corridor would be preferable.

~ Criteria is mentioned that project "shall not dredge within 10 feet of toe of flood control salt pond levees". In view of flood refugia for protected species such LL1-4

Page 1

as Salt Marsh Harvest Mouse and California Clapper Rail this is still too close for deep dredging of the restored channel. Please consider flood control terraces instead.

~ Terraces are an accepted component of river channel design and geomorphically sound if dredging will leave them in place. As invasive vegetation root mass is removed then benign salt water species may reestablish. Terraces could also provide a safety factor for recreation boaters. LL1-4

~ I believe alkali bulrush has been a flood management challenge in its method of entrapping sediment and mounding up to preclude more benign saltwater species. Can outfow from saline conditions in Pond A8 help? LL1-5

~ There is some analysis as to presence of California Clapper Rail further downstream in Alviso Slough but it must be factored in that in times of winter storms and low barometric pressure these species instinctively move inland and to higher ground and therefore this refugia needs to be retained and hopefully enhanced. LL1-6

~ The nesting of Western Snowy Plover in Pond A8 is mentioned but its habitat needs are not in sufficient detail in consideration that Pacific coast population of western snowy plover is federrally listed as threatened. Please reference US Fish & Wildlife Service Western Snowy Plover Pacific Coast Population Recovery Plan. Pond A8 and Pond A8D comprise the local recovery Alviso site. LL1-7

~ The lowering of Pond A8 weir would also need to be reviewed in regards depth and frequency of incidence of flooding of both Pond A8 and Pond A8D. Will high water reach nesting levees or low water permit access by predators? Pond A8D is referenced minimally in DEIR and yet it would appear to be the prime prospect for habitat refugia. LL1-8

~ Bay water levels in winter storms of 1983 reached 9.8 NGVD at San Jose Water Treatment Plant, which is a foot above present Pond A8 weir elevation of 11.39 NAVD. In times of low barometric pressure and a heavy storm system holding over Mount Umunhum, Pond A8 may be full with high tide before it has an opportunity to provide floodwater overflow relief to keep Guadalupe River peak flows from Town of Alviso. Please review this modeling and advisability of project proposal to lower 200 to 370 feet of Pond A8 weir 1.3 or 1.4 feet. Flow of high water throughout pond system as depicted in Appendix A Figure A-4 will function how in incidence of a 12.6 NSVD high tide during low barometric conditions of a sustained storm event? LL1-9

~ DEIR references a 20 to 40 foot wide notch in Pond A8 for connection to Alviso Slough as part of SBSP Restoration discussions while page 5-2 of Engineer's Report says modeling analysis indicates A8 weir be lowered by up to 1.4 feet across most of its 1,100 foot extent to maintain existing 1 percent flow split. This is a big difference. Are National Refuge biologists comfortable with this scenario? Where is tide modeling? LL1-10

Libby Lucas 7_9_08.txt

~ In the DEIR and Engineer's Report I question use of 17,000 cfs as the one percent Guadalupe River flow as that is a thrity year old US COE estimate. Aren't 22,000 cfs or 23,000 cfs the recent flow figures referenced? LL1-11

These are my first round of observations and would like to comment more fully after July 16's public hearing. Afraid I have mixed feeling about all the alternatives presented and need to review them in further detail.

Thank you so much for any consideration you can give to these concerns.

Libby Lucas

174 Yerba Santa Ave.,

Los Altos, CA 94022

Get the scoop on last night's hottest shows and the live music scene in your area - Check out TourTracker.com!

This page intentionally left blank.

Response to Libby Lucas letter 1 (LL1)

LL1-1: Please refer to DFG-24 for explanation of 2:1 mitigation.

LL1-2: Comment noted.

LL1-3: The objectives of the project include expanding the channel width and improving navigation. Leaving a fringe of marsh along the channel would not meet the objectives of the project. With respect to leaving a 40-50 foot wide band of upland vegetation along the upper fringe of the marsh, this is simply not possible at this location. Alviso Slough is constrained by steep flood protection levees and salt pond levees. However, there would be opportunities within the SBSP Restoration Project, which is one of the primary mitigation options for this project, to create such transition zone habitat.

LL1-4: Comment noted. The purpose of this Project is to maximize the channel's open water width for improved navigation and boating.

LL1-5: Outflow from Pond A8 would affect existing vegetation, including alkali bulrush, due to an increase in salinity levels and scour of vegetation. Section 3.4.4 of the EIR provides further details on the SBSP Phase I Action at Pond A8.

LL1-6: Upland refugia are limited along Alviso Slough. Clapper rails tend to move towards levees and higher ground during high tides. This project does not eliminate any high-tide Refuge habitat, nor are California clapper rails expected to occur in this portion of the slough, even at high tides or storm events.

LL1-7: Low densities of snowy plovers have been recorded during the breeding season, sometimes with nests or chicks, at Pond A8. Breeding occurred sporadically during the 1990s and early 2000s, and there was no recorded nesting over a period of several years. Under the Initial Stewardship Plan (ISP) management regime, Pond A8 has been managed as a seasonal pond, drying every summer. That management program has attracted western snowy plovers to again nest in small numbers on the pond. Ten nests were located in Pond A8 in 2006 (Robinson et al. 2006), and 5 nests were located in 2007 (Michael M. Rogers, pers. comm.). This project would be closely coordinated with the SBSP Restoration Project which is balancing the restoration options to achieve the goals set forth in the USFWS Western Snowy Plover Pacific Coast Recovery Plan. Pond A8 is currently slated to be converted to muted tidal habitat and not managed for snowy plovers.

LL1-8: Please refer to Master Response 4. Please also refer to USFWS-4 for a discussion of potential for flooding associated with lowering of the weir. Mitigation Measure HYD-A in Section 3.1.3 of the Final EIR (page 3.1-14) provides further details concerning Pond A8.

LL1-9: Commenter's observations are noted. If extreme high tides coincide with an extreme storm event, the Pond A5-A6-A7-A8 complex may be full with tidal flows that have overtopped the ponds' bayside levees, and may not provide floodwater overflow storage.

The hydraulic modeling analyses that were performed for the LGRP as well as for this proposed Alviso Slough Restoration Project, followed the Federal Emergency Management Agency's (FEMA) criterion of using a 10-year tide combined with a 100-year river flow. A 10-year tide in the South Bay is 10.2 ft NAVD88. The incidence of a higher tide (such as the 12.6 NSVD [sic] mentioned in this comment), coinciding with an extreme storm event, could constitute a greater-than-1-percent event, and could overwhelm the flood management system in place for the Lower Guadalupe River.

LL1-10: The Pond A8 notch is a different structure than the Pond A8 weir. The notch, when installed, would be 40 feet wide, with eight (8) bays, or gates, each a width of 5 feet. One or two of these gates may be opened when the notch first begins operations to induce a muted tidal activity between Pond A8 and Alviso Slough. More gates may be opened in the future, depending on the effects of this muted tidal activity on levees along the slough. USFWS would be the owner and operator of the notch.

Please also refer to Master Response 4 regarding the proposed lowering of the Pond A8 weir to maintain 1 percent flood protection in the Alviso area.

Appendix IV of the Final EIR, Hydraulic Modeling and Analysis of Project Alternatives, present the detailed hydraulic modeling analyses that were performed as part of this Project's planning work. As stated in LL1-9, hydraulic modeling of the 1 percent (or 100-year) flow event included a 10-year tide, as per FEMA's criterion for analysis of 1 percent flood events in coastal areas.

LL1-11: The LGRP was designed to convey a peak 100-year flow of 18,350 cubic feet per second (cfs), as established by the USACE and the District for the Downtown Guadalupe River Flood Protection Project. If the hydrology for the Guadalupe watershed is updated at some point in the future, and if peak flows increase, measures would have to be implemented in the upper areas of the watershed so that cumulative runoff does not exceed the capacity of the Downtown and Lower Guadalupe River reaches.

DF

Diana Foss comments 7_28_08.txt

From: Diana Foss [mailto:diana@mooseyard.com]
Sent: Monday, July 28, 2008 8:04 AM
To: Mike Coleman
Subject: Alviso Slough Restoration Project

I am not in favor of the staff-recommended Alternative 5 for this project. I support the environmentally-preferable alternative, which is no project at all. The project as proposed does nothing to increase flood protection or improve the natural environment. Economic development and boat recreation are not responsibilities of the SCVWD. DF-1

Sincerely,

Diana Foss
1571A Lincoln Ave.
San Jose, CA 95125

This page intentionally left blank.

Response to Diana Foss (DF)

DF-1: Comment noted.

This page intentionally left blank.

LL2

Libby Lucas - Alviso Slough Restoration Project DEIR and Draft Engineer's Report - 2nd comment.txt
From: JLucas1099@aol.com [mailto:JLucas1099@aol.com]
Sent: Wednesday, July 23, 2008 8:09 PM
To: Mike Coleman
Subject: Alviso Slough Restoration Project DEIR and Draft Engineer's Report - 2nd comment

Michael F. Coleman, Environmental Planner
July 23, 2008

Santa Clara Valley Water District

5750 Almaden Expressway

San Jose, CA 95118

Dear Michael Coleman,

In regards Santa Clara Valley Water District's Alviso Slough Restoration Project DEIR and Draft Engineer's Report I would like to elaborate on my earlier comments, in light of the priority that your recent public hearing gave to Alternative 5.

~ There are three levels of vegetative habitat that I believe need to be incorporated on Alviso Slough's eastern bank between Santa Clara County's Marina boat ramp and Taylor Street. There is the District's maintenance permit that requires a minimum 20-foot wide fringe of marsh along the low flow channel for the Guadalupe's anadromous coldwater fishery of salmon and steelhead. There is the 25 foot plus vegetative buffer at top of bank to filter non-point source pollution from the waterway (which should be outboard of any recreation trail). And then, as suggested in earlier comment, a vegetated terrace is needed at appropriate height to support pickleweed and salt grass in order to provide wildlife corridor and habitat for the salt marsh harvest mouse.(This terrace would be a more normal, geomorphic gradation of riverine bank or slough than a dug out basin). LL2-1

~ Project criteria to not dredge within 10 feet of toe of flood control salt pond levees might be more feasible on Alviso Slough's western bank and presume that this is accepted best management practice by Cargill. The lowering of this Pond A8 levee by 1.4 feet for a length of 1100 feet however would give me pause as mightn't it possibly accelerate erosion of that entire salt pond levee in a major high water storm/flood event? Consultation with US Fish & Wildlife Service, Cargill and US COE would seem to be indicated for this action. LL2-2

~ There appear to be two scenarios for winter and flood management of Pond A8 which do not quite agree. The Appendix A Figure A-4 Pond System Flow Directions show Guadalupe River high flood flows passing through Pond A8 to Ponds A 7 and A5 and out to Guadalupe Slough and Pond A6 at levels when hightides in the Bay are likely to be coming back into these same ponds to meet them. An alternative scenario has tide gates closing these same pond levee.s off from high winter bay levels and keeping capacity in Ponds A7 and A5 for Pond A8 overflow. Both scenarios need to be reconciled with US Fish & Wildlife Service SBSP Restoration pond management plan for the ponds as agreed to by regulatory agencies and public this year. LL2-3

Libby Lucas - Alviso Slough Restoration Project DEIR and Draft Engineer's Report - 2nd comment.txt

~ Also consideration should be given to present Guadalupe Slough tidal prism of scouring flows which appears to keep boat ramp and slough channel navigable for NASA and Sunnyvale Plant employees and to ensure against any alteration of salt pond circulation diminishing flows or unbalancing present conditions. In modeling these scenarios we would like the water and salinity levels addressed to ascertain what vegetation will become established in these ponds. There was uncertainty as to whether bare mudflats or brackish alkali bulrush will predominate with the different gameplans. A site specific analysis would be appreciated. LL2-4

~ In closing would like to reference restoration advice from our favorite estuary scientist, Dr. Peter Baye.

"The terrestrial ecotone species mix would depend on where the site is along the annually fluctuating salinity gradient -long axis of Alviso area sloughs, and the substrate type ie.(dredged bay mud? imported terrestrial fill for engineering properties?)

Bare graded soils need fast cover to smother/outcompete seedlings of Dittrichia, Bassia, Lepidium latifolium, etc, as well as long-term slower perennial cover to lock them out for good. PHASED planting - vegetation establishment planning is indicated for levees, slowgrowing creeping perennials and subshrubs, and faster-growing short-lived annual to provide rapid cover initially, using species that will eventually be outcompeted by taller clonal perennials and subshrubs. Preferable to have semi evergreen species to serve as high tide cover in winter.

For long-term cover near high tide line and above in clayey soils with relatively low salinity, a mix of creeping wildrye (Leymus triticoides), marsh baccharis (Baccharis douglasii), gumplant (Grindelia hirsutula; syn. G. stricta var.angustifolia, local source), and saltgrass (Distichlis spicata) with alkali-heath (Frankenia salina) would be a resilient mix, adaptable to much variation in rainfall. Key is to plant ONLY during cold, early rainy season (Nov-early Jan), and bare-root transplants if possible.

For short-term cover, any fast growing, dense annuals to compete with worse weeds is indicated. For saline dredge materials, Atriples prostrata (~A.triangularis) would work. It was formerly treated as native, but it is not, still, fairly harmless and already well established. For less saline or nonsaline materials, inexpensive nonnative ryegrass (Lodium perenne) would be more manageable that Dittrichia, Lepidium, etc., and it's out-competed by the perennial species over a 5-10 yr. period.

Lots more species could be added for diversity...longer plan needed."

Final note, there is a thriving colony of Dittrichia on the improved levee at Santa Clara County Alviso Marina. Would like to put in request that, if possible, trees in emerging riparian corridor along Alviso Slough in project area be preserved and worked around if possible as they provide needed diversity of habitat. Also, disagree with statement that project will not impact any bird species until the Western Snowy Plover Recovery Plan that US Fish & Wildlife Service have just issued for Pond A8 is incorporated into Alviso Slough's Restoration and that an upland refugia element is devised for down-slough California Clapper Rail in highwater conditions. LL2-5

Thank you for an opportunity to review this Alviso Slough Restoration Plan.

Libby Lucas - Alviso Slough Restoration Project DEIR and Draft Engineer's Report - 2nd comment.txt

Libby Lucas, Conservation

CNPS, Santa Clara Valley Chapter

174 Yerba Santa Ave.,

Los Altos, CA 94022

Get fantasy football with free live scoring. Sign up for FanHouse Fantasy Football today.

This page intentionally left blank.

Response to Libby Lucas, letter 2 (LL2)

LL2-1: Comment noted.

LL2-2: Mitigation Measures HYD-D and HYD-E both address the long-term maintenance, inspection, and coordination with USFWS of the levees in the Project area. Cargill no longer owns any land in the Project area. The USACE would be involved in the permitting aspect of this project, and would also be apprised of project progress and long-term changes in the Project area as they relate to USACE's South San Francisco Bay Shoreline Study.

LL2-3: This project is being closely coordinated with the SBSP Restoration Project for all overlapping pond management plans.

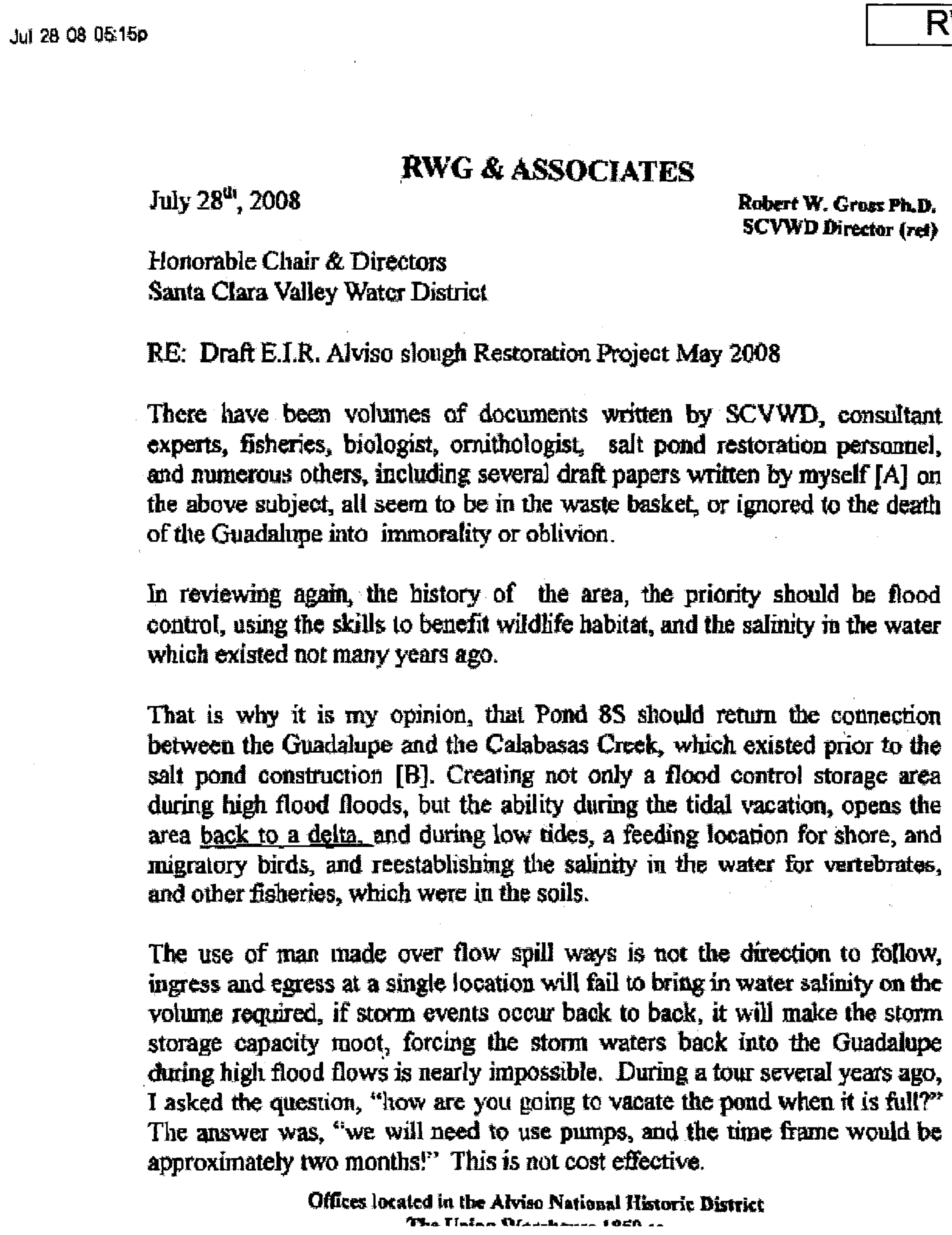
Appendix IV, Figure 4, shows the Pond A8 system flow directions in response to a fluvial flood event that would trigger overflows to Pond A8. During a 100-yr flood, the Pond A8 weir would divert a portion of the flow into Pond A8. Larger floods that exceed the storage capacity of Pond A8 would then overtop the internal pond levees and flow into Ponds A5, A6, and A7, which would provide additional storage capacity. It is assumed that the 'alternative scenario' described by the commenter refers to the closing of the Pond A8 notch during the winter to maintain flood storage capacity in Ponds A8, A7, and A5. These two scenarios are consistent with the District's modeled scenario and the Pond A8 Operations and Maintenance plan (in progress).

LL2-4: The focus of this EIR is the proposed Alviso Slough Restoration Project. Since Alviso Slough is not hydraulically connected to the Guadalupe Slough, the tidal prism and scouring flows in Guadalupe Slough are not considered in the document. The Alviso Slough Restoration Project's focus is removal of vegetation and root mass in the slough; vegetation that may become established in the ponds as a result of the SBSP Restoration work is not addressed herein. Please refer to the SBSP Restoration EIR with regards to this issue.

LL2-5: The text of the Final EIR in Section 3.4 (page 3.4-12) has been changed to acknowledge the *Dittrichia* colony. Under Alternatives 1-4, willow trees along Alviso Slough would not be removed. However, the proposed SBSP Phase 1 Action at Pond A8 would result in increased scour and salinities in the slough and the willow trees would likely not survive. Please refer to LL1-6 and LL1-7 for response to latter half of this comment.

This page intentionally left blank.

RWG



Jul 28 08 05:15p

RWG & ASSOCIATES

July 28th, 2008

Robert W. Gross Ph.D.
SCVWD Director (ret)

Honorable Chair & Directors
Santa Clara Valley Water District

RE: Draft E.I.R. Alviso slough Restoration Project May 2008

There have been volumes of documents written by SCVWD, consultant experts, fisheries, biologist, ornithologist, salt pond restoration personnel, and numerous others, including several draft papers written by myself [A] on the above subject, all seem to be in the waste basket, or ignored to the death of the Guadalupe into immorality or oblivion.

In reviewing again, the history of the area, the priority should be flood control, using the skills to benefit wildlife habitat, and the salinity in the water which existed not many years ago.

That is why it is my opinion, that Pond 8S should return the connection between the Guadalupe and the Calabasas Creek, which existed prior to the salt pond construction [B]. Creating not only a flood control storage area during high flood floods, but the ability during the tidal vacation, opens the area back to a delta, and during low tides, a feeding location for shore, and migratory birds, and reestablishing the salinity in the water for vertebrates, and other fisheries, which were in the soils.

The use of man made over flow spill ways is not the direction to follow, ingress and egress at a single location will fail to bring in water salinity on the volume required, if storm events occur back to back, it will make the storm storage capacity moot, forcing the storm waters back into the Guadalupe during high flood flows is nearly impossible. During a tour several years ago, I asked the question, "how are you going to vacate the pond when it is full?" The answer was, "we will need to use pumps, and the time frame would be approximately two months!" This is not cost effective.

RWG-1

Offices located in the Alviso National Historic District

The over growth of fresh water with the invasion of Spartina, has choked off the stream capacity with non- indigenous plants, destroying the natural habitat for wildlife [C]. RWG-2

During the last several decades, the Guadalupe has lost shore bird feeding, habitat, fisheries, why not let nature do its work, saving in costs, and voodoo engineering that is experimental, is not long range planning/ RWG-3

As an example; the Guadalupe was the habitat for six classification of swallows [from thousands down to several hundred] no longer reside in the area, and the disappearance of many fisheries classification, is tragic [D].

It is again, my opinion, that an interconnection between the two streams is simple, cost savings, creating a delta in Pond 8S offers the District to become a leader in the science of flood control, and providing not only flood protection, but is environmentally sound. RWG-4

As always, if I can be of service in anyway, please do not hesitate to call me.

Very truly,

Robert W. Gross Ph.D.
SCVWD Director [ret]

w/a

Ex. A

Robert W. Gross Ph.D.
SCVWD Director ret
RWG Environmental & Land Consultant

January 2005

Mr. Clyde Morris, Refuge Manager
United States Fish & Wildlife Service
S.F. Bay Don Edwards National Wildlife Refuge

DRAFT PAPER
(subject to modifications)

R.E. Personal opinions; Salt Pond Restoration - the establishment of the historic tidal (delta) connection between the Guadalupe River and Calabazas Creek

Dear Clyde:

The intent of this paper, is not to engineer or how to at this time, the goal is to implement a philosophy, and understanding, ***"what is restoration?"*** For 10 years, I served as an advisor to the U.S. Corps of Engineers, and the SCVWD flood control as an advisor to this zone. Following that experience, elected as a SCVWD Director (20 yrs. ret.), those experiences presented an opportunity to study, write research notes on, ***"the death of lower Guadalupe River."*** The conclusion I reached, "there is no single cause to this environmental degeneration." It is evident, the lack of salinity, the lack of stream maintenance, and lack of political care, all contributed to the destruction of these waters.

There are a number of variables which changed the health of this stream; the construction of the salt evaporation ponds, up stream growth, greed, fresh water intrusion from the waste water treatment facilities, created a journey of nearly an irremediable catastrophe.

What is tragic, during this time period, including this date, there is a dispute if the South Bay can be re-vitalized? Observation indicates that there are conflicts in data integrity, accountability, common sense, lack of understanding, together, they will cause delays if not addressed soon. ***"The death of the lower Guadalupe River,"*** forces one to question the foolish engineering, costs out of control, environmental reviews, individual prejudices, and the discrepancies in, ***"what is the true definition of restoration?"***

The concerns should be clear, simple; the enhancement of the environment, improve the water quality, provide flood protection, and other multi use benefits.

Recommendation: Return the historic flows between the Guadalupe River, and the Calabazas Creek, establishing a tidal delta connection which once existed where Pond A8S is located. The vertical tidal volumes will increase the hydrology, the salinity in both streams, the fisheries, the birds, the nesting, including other habitat which once existed.

The Mudflat Refuge Alviso National Historic District
Offices in the Union Warehouse circa 1850
1200 Hope Street # 55 Alviso, CA 95002 -0855 tel/fax 408.263.4170
Mobil # 408.209.3316

The historic connection between the two streams will be re-established, increase the tidal action, serve as a flood storage reserve during heavy storm events, and during the tidal exit, a feeding area would return in the mudflats for wildlife, and birds. Having this circular tidal volume, and hydrology, it would also increase the salinity from the San Francisco Bay (salinity is a subject which needs to be explored in more detail). Most important, this action would reduce the chance of introducing foreign waters or other containments to enter into Pond A8N. The capping of existing levees (where needed) will become attractive, giving protection for the nesting of birds, the habitat, and other multi use benefits.

Detailed engineering has not been provided in this generic proposal at this time, however, the design criteria will fall into place, if the human mind is open to understand the end goal. It is my opinion, there will be costly delays, potential flooding, continual degradation in the water quality, and the ***"death of the lower Guadalupe River"*** will continue, if action is not introduced soon. Flood control must be an integral part of restoration, for it is nature's tool for the cleansing, and the re-birth of the waters.

In closing, my grandfather told me a story about a farmer required water from the adjacent stream for his crops. So he carved a trench from the stream into his land at one end, he was so thrilled when the water started to flow, and then the water stopped. A young boy had been watching him for a week, and asked the him, " how are you going to water the rest of your land?" The farmer responded, "I am going to pump it up there from down here!" The boy said, "why don't you open the stream at the other end, and let the water flow down here?"

Can restoration be practical, have common sense, be cost effective, use of natural engineering, and be beneficial as a multi purpose facility? The answer is yes, why not let nature do the work, nature will restore itself, if the proper tools are provided. Clyde, with your leadership, your skills, it can be accomplished, avoiding the disruption of Pond # A8 N with the introduction of foreign waters with unwanted contaminates.

If I can be of service in anyway, please do not hesitate to call upon me. Let us provide these benefits back into the environmental community, as well to the citizens, and stop ***"the death of the lower Guadalupe."*** Don't you think it is time for the caretakers to give birth to future generations of wildlife, birds, fisheries, and even humans?

Respectfully submitted,

Robert W. Gross Ph.D.
Alviso Water Task Force member

Cc: Salt Pond Restoration Team - Steve Ritchie
SCVWD - Dick Santos - Director
Alviso Water Task Force - Geo Tiivino Chair

W/attachments

References:

Assessment of Potential Fishery Habitat Benefits/Adverse Effects of Proposed Vegetation Removal and Tidal Enhancement within Lower Alviso Slough Prepared by Charles H. Hanson Ph.D. January 2004

South Bay Salt Pond Restoration 8/2/04 Mercury Technical Memorandum Final Draft

REVISED DRAFT PROPOSALS
Flood Control in North San Jose
Lower Guadalupe River
in the Alviso District
September 2005

The recent disastrous experience in the Southern Gulf States, brings back a memories of the 1983 flood in North San Jose, and the community of Alviso, also many other locations thru out Santa County. Because of time, flooding may not be on the radar screens, but to out guess nature, is foolish. Any tragedy like the above, seems those in power with common sense make preventive decisions in advance, not be bogged down with studies, hypothetical theories which do nothing but produce piles of bureaucratic papers no one reads or understands, and then it is too late.

This draft white paper is addressing the District of Alviso, North San Jose Golden Triangle business parks, residential, industrial, Highway 237, the regional waste water treatment plant, and hosts a major recycling investment. If for any reason, these treatment facilities become inedited with flood waters, it will be a major economic disastrous to Santa Clara County and the State of California.

PROBLEM

- Adequate storage capacity for high run off flows during a major storm event in the Lower Guadalupe River.
- Restoration the delta of tidal flats which existed prior to the construction of the salt pond evaporation ponds decades ago.
- Increase the tidal action which previously existed.
- Improve the fisheries which previously existed.
- Return the shore and migratory bird feeding in the mudflats during a minus tide.
- During the increased tidal flows, there will be an increase in the salinity, decreasing the fresh water non native vegetation choking the sides of the river, are only some examples to consider benefiting all sides.
- Clearing of existing non native vegetation from the Guadalupe.
- Too much time in planning vs. the reality of flooding.

APPLICATION

Over the years, there have been other proposals which have been considered, it is my personal opinion, that following concepts provide protection, at the least cost, environmental enhancements, and recreational opportunities in N. San Jose if agencies get out of the way, and resolve.

Records, and old photographs of the Alviso area, the Rio San Jose de Guadalupe crossed over to the Calabasas (see map 1869) diverting flood waters to the West, away from Alviso. This same map indicates that the Guadalupe Slough ended in front of the South Bay Yacht Club. Some where in history (see 1939 photo), the up stream Guadalupe changed at this location direct into the Guadalupe Slough to the bay. The rest is history, when the salt evaporation ponds were developed, new levees constructed around them, the destiny of the river had changed.

RECOMNEDATION

There is considerable discussion over the Federal Salt Pond Restoration with United States Fish & Wildlife Service, other local, state, federal agencies all interested parties have their personal opinions and needs, placing flood control in the end of the parade with bureaucracy.

1. Re-establish the historic flow back to Calabazas connection (see air photos pond A8(D) with lower Guadalupe river near the UPRR bridge.

2. Construct a 30" pump at the lowest point in Alviso, Hope and Catherine Streets. The small Gold Street internal pumping station cannot handle a major storm event (ability is a 3 year+/-) and to vacate the storm drains, based upon an agreement with USF&WS, to regulate the level of water in the New Chicago Marsh regardless of the conditions in Alviso is wrong.

CONCLUSION

Adopt the above, using an emergency act to expedite the levee construction, and opening configuration, it is easier to do it now, if not, there will not be enough courts and attorneys to cause litigation against all agencies.

This is a generic look at the problem, and seems simplistic on the surface, and the connection between the two rivers could be under construction under an emergency act, a dredger open the East and West ends, it would become a storage area during heavy flows, vacating with two streams, creating a tidal prism, a delta, and mudflats for shore and migratory birds when the tide vacates, with wildlife habitat on the levees. This proposal would not disturb Pond 8A, or require pipes, spill ways or pumps to vacate excessive flood waters.

Flood protection is vital for the survival of the City of San Jose (waste water treatment plant) the County, and the Golden Triangle, The leadership has the ability to do some preventive construction, let us not wait until after the fact, and get involved now, there is a large dredger available in the bay area, and construct a new independent 30"+ pump direct into the Guadalupe at the location mentioned above to reduce Alviso from street flooding,

Plans to vacate the South East failed, let us not do the same, use our Federal and State legislators, to give the environmental authority to start now before it is too late like in 1983. Be assured, there will be billions and billions of dollar loss, environmental costs, and damages will be unknown, if we contaminate our waters from flooding like in the South Eastern part of the United States, and we did nothing to prevent it, that will be tragic, because you have been advised.

Respectfully submitted,

Robert W. Gross Ph.D. [ret]
Director Santa Clara Valley Water District

Attachments: Air photos

RESPONSE TO SCVWD ALVISO SLOUGH RESTORATION PROJECT STUDY DATED FEBRUARY 2006

DRAFT AND OPINIONS 5/2/06

DUE TO TIME RESTRAINTS - PAPER NOT PROOF READ
RW GROSS PH.D.

1. Who or whom authorized this study to be published, and why did SCVWD staff do this study when they have hired a consultant for that purpose?
2. Who or whom released this study, and how much did it cost the taxpayer for SCVWD staff to produce this document?
3. Why was the consultant given a copy of this in house study? The staff has given the guidelines in which they have already prejudice/ influenced the consultant what they are looking for in a future report?
4. Why were other professionals not quoted for their work such as: Mewalt, Harvey, Anderson, Shellhammer, Hanson, Goldner, and Di Vitorio? This is a real concern not include their work as reference is visually prejudice. However, another force forgot more than the staff or the consultants will understand, but to ignore those which have spent their entire life in the region gathering data as professional fisherman, and hunters, their life and business depended upon their knowledge of the waters. Not to use this knowledge, is inexcusable.
5. What is the direct experience staff on this area, other than scanning other studies?
6. The report referenced all these studies, why were those papers not attached to the report given to the AWTF?
7. Why did the District spend hundreds of thousands of dollars up stream of the Gold Street bridge on experimental engineering when they were told, it would not work? Who or whom authorized this work, and who or whom approved the stream enhancement having this knowledge?
8. Why did this study not address seals, shore bird feeding, migratory bird, historic fisheries, reason for the loss of salinity, and the real habitat loss?
9. Who or whom associated this area with the salt pond study, knowing that having more agencies involvement would only cost hundreds of thousands of dollars more in time and money to the project, but still failing to understand the problems?
10. How can staff justify the thinking they are capable of vacating waters in Pond 8 after a major storm event fills the storage capability, If one were to use the area of the Alviso village as a comp in size of Pond 8, after the 1983 flood, it took over 2 weeks to remove subject flood waters (using every major pump available in N. California), how does staff intend to remove those waters is impossible if a back to back storm occurs.
11. What is the salinity from Gold Street bridge to Hwy 237?
12. What is the salinity from Gold Street bridge to the county marina?

13. Under present conditions, what are the cfs from the Gold Street bridge to hwy 237 during a 25 year storm event?
14. Under present conditions, what are the cfs from the Gold Street bridge to the county marina during a 25 year storm event?
15. Define the staff's opinion of what does restoration mean, historic review, and to what standards?
16. Define what historic habitat is vs. today's uncontrolled aquatic growth?
17. How can the District set standards for up stream of the Gold Street bridge, but yet from the same subject bridge to the county marina, establish a total new separate criteria for restoration?
18. How can the community trust this report, when past history has proven without a doubt, who really is in control of flood control?
19. How can the community trust the district, this report, when a visual observation shows a complete failure from the Gold Street bridge to hwy 237, now the AWTF is being asked to support this staff study, hiring a consultant for what, accountability and creditability is on the line, and observation is very weak at its best to support the quality of this report is in question?
20. Who or whom authorized a delay from 07 to 08, observation tells one that the District is not in charge of flood control, how can you explain that?
21. Who or whom is in charge of flood control from the Gold Street bridge to the county marina?
22. WET social ratings are subjective by the district staff, and there are a lot of buzz words, but lack serious foundation, not quoting or referring to unknown references without the documentation for review by the community is just another example of ignoring the community needs.
23. At what point did the study change from 7 ac +/- to 60 ac?
24. Reference is made to up land habitat protection of new invaders, there is a void in the history of fisheries, birds, and various animal loss, why has this not been reported in the study?
25. Steelhead are not a resident in the Alviso area, they are only a traveler, they do not make this area a natural habitat, it is only a highway up stream, to use them in any other text is catering to other agencies, groups, and not the purpose to clean the water, and make it a healthy stream.
26. Value assessment again is subjective by the author, reviewing the text in this report, lacks of years of personal study in the area. To heavily quote others, and the failure to look at those that spent the time in the trenches lacks understanding of micro and macro influence on the health of the stream, and the ability to move high flows in the time of need.
27. I strongly urge the district staff investigate the historic background of Alviso, the requirements of NHPA, there are 19 historic sites (the yacht club is only one referenced, and the county marina is not listed). The 19 which are on the National Historic Register, and the City of San Jose Landmarks is just another example not knowing the subject, there is an attitude problem, just to go on line with the computer and write a questionable report is an indicator of the intent or purpose of this information.

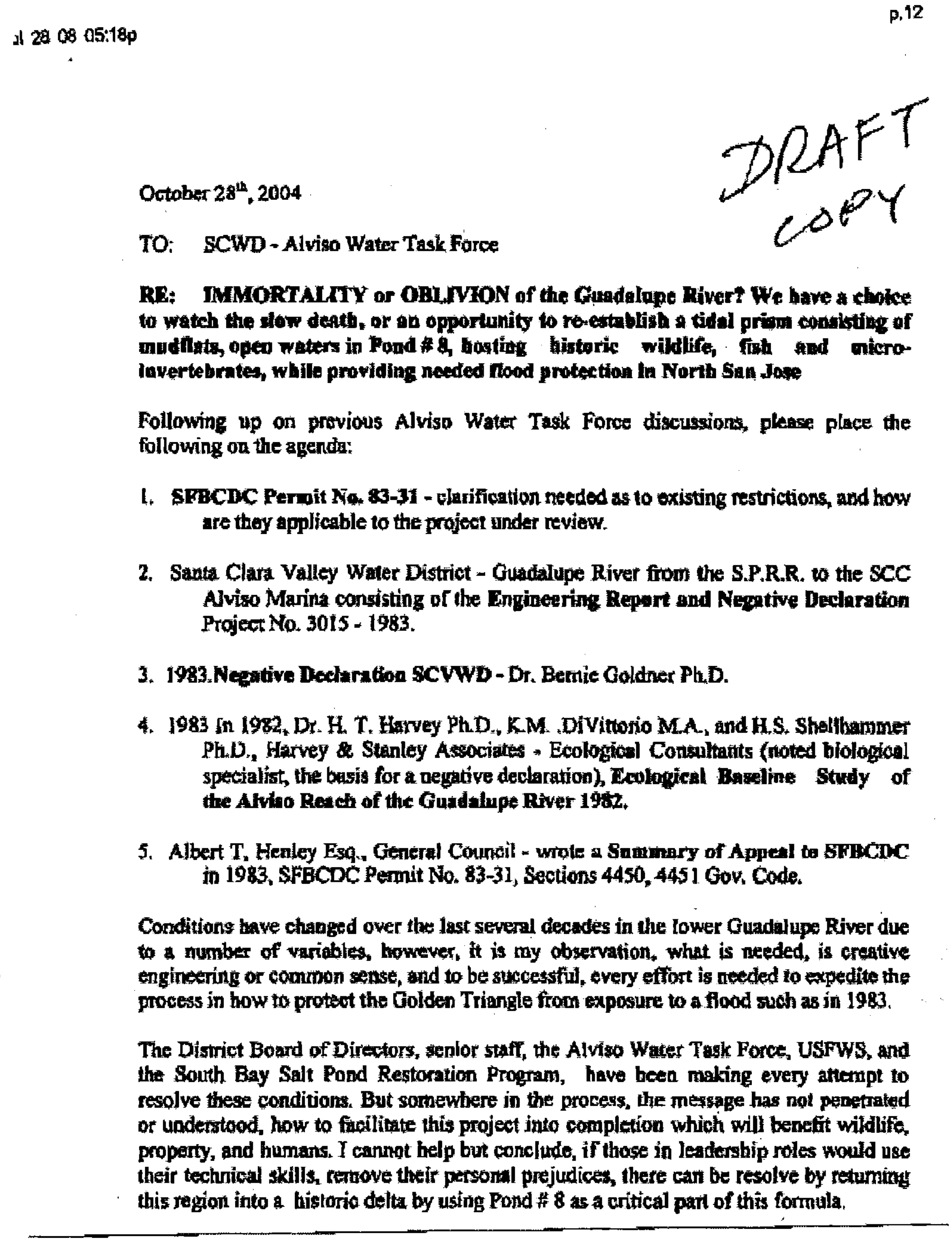
28. There is a very important factor in any study in this reach, not to mention the historic role New Chicago Marsh plays in flood protection is a lack of total understanding of the subject under discussion.

29. The San Francisco Bay Bird Observatory has done some major work in the area in the earlier years, today, it is made up of many volunteers, and students, which is not all bad, however, the lack of historic events vs. what the stream hosts today, are some very difficult decisions. One point is clear, none of their staff attend AWTF meetings, that again leaves any research open to creditability or a broad understanding of what is flood control's relationship to a healthy stream.
30. How can one agree or justify a conclusion on what is historic restoration, when the references are confined to the last 4-5 years, or are just pulled off a reference list? Did the district staff just go to outside agencies with a shopping bag, "oh is this what you want? " SCVWD is the flood control agency, start assuming your role, become a leader, not a follower.
31. Not using as a reference in this study, local individuals that have spent their entire life in these waters, forgot more than a dozen biologists using a computer which regurgitates a language which lacks foundation of the real history, is an insult to the community,. knowing that these individuals have forgot more than any team which the district may assemble, that I find tragic, don't you?
32. One final question, if the district is using outside consultants, why does the district need internal staff, or is this a bureaucratic way to CYA?

ATTACHMENTS:

OPINION DRAFT STUDY BY R. W. GROSS PH.D.
IMMORTALITY OR OBLIVION OF THE GUADALUPE RIVER 10/28/04

TIDELINE SF BAY NATIONAL WILDLIFE REFUGE COMPLEX
IN THE TRENCHES WITH INVASIVE SPARTINA WINTER 04/05



ıl 28 08 05:18p

p.12

DRAFT COPY

October 28th, 2004

TO: SCWD - Alviso Water Task Force

RE: IMMORTALITY or OBLIVION of the Guadalupe River? We have a choice to watch the slow death, or an opportunity to re-establish a tidal prism consisting of mudflats, open waters in Pond # 8, hosting historic wildlife, fish and micro-invertebrates, while providing needed flood protection in North San Jose

Following up on previous Alviso Water Task Force discussions, please place the following on the agenda:

1. **SFBCDC Permit No. 83-31** - clarification needed as to existing restrictions, and how are they applicable to the project under review.
2. Santa Clara Valley Water District - Guadalupe River from the S.P.R.R. to the SCC Alviso Marina consisting of the **Engineering Report and Negative Declaration** Project No. 3015 - 1983.
3. 1983.**Negative Declaration SCVWD** - Dr. Bernie Goldner Ph.D.
4. 1983 In 1982, Dr. H. T. Harvey Ph.D., K.M. .DiVittorio M.A., and H.S. Shellhammer Ph.D., Harvey & Stanley Associates - Ecological Consultants (noted biological specialist, the basis for a negative declaration), **Ecological Baseline Study of the Alviso Reach of the Guadalupe River 1982.**
5. Albert T. Henley Esq., General Council - wrote a **Summary of Appeal to SFBCDC** in 1983, SFBCDC Permit No. 83-31, Sections 4450, 4451 Gov. Code.

Conditions have changed over the last several decades in the lower Guadalupe River due to a number of variables, however, it is my observation, what is needed, is creative engineering or common sense, and to be successful, every effort is needed to expedite the process in how to protect the Golden Triangle from exposure to a flood such as in 1983.

The District Board of Directors, senior staff, the Alviso Water Task Force, USFWS, and the South Bay Salt Pond Restoration Program, have been making every attempt to resolve these conditions. But somewhere in the process, the message has not penetrated or understood, how to facilitate this project into completion which will benefit wildlife, property, and humans. I cannot help but conclude, if those in leadership roles would use their technical skills, remove their personal prejudices, there can be resolve by returning this region into a historic delta by using Pond # 8 as a critical part of this formula.

Again, as an observer, there are individuals which have spent their entire life as professional fishermen in this reach, and they have decades of records, experience in the lower Guadalupe River to the South San Francisco Bay, we must draw upon their knowledge. Their understanding of the loss of salinity, tidal flows, flooding, the loss of fishery etc., should not be overlooked. Reports from outside biologist, fishery experts etc., all have concluded, the river must develop a tidal prism, increase the salinity, removal of vegetation, reinstate the prior environment, and the ability for high flood flows to enter into the Bay without constraints.

"Let us not turn a parking ticket into a ticket to the electric chair," like we are witnessing today with delays, mitigation costs vs. the project should be questioned.. It is imperative, that District staff contact all Local, State, and Federal legislators, and move this project forward, by demanding a full blown public hearing with all of the state agencies, USFWS, and the South Bay Salt Pond Restoration Program, to fully understand the serious problems facing the District, and what historic restoration means. The priority should be for flood control, a healthy stream, using common sense, and engineering, nature has the ability to restore, if the will is to really look at its past history of the original mudflats (delta) how it had the environs prior to the construction of the ponds.

Make note, a negative declaration was written in 1983 by the District, and it was approved by all of the governing agencies. Why is this data not applicable for this project? After all, this information should have been formulated in the earlier discussions with all of the agencies, or why wasn't the District staff be as assertive as in the past as the flood control experts? It is my personal opinion, there is adequate criteria at the District to justify a negative declaration, or even an E.I.R. These agencies look to the District for their leadership and management of the waterways, after all, they have the needed skills, to take responsibility, and the charge, as mandated under law.

It is again, my opinion, clarification is needed, "voodoo" criteria vs. real numbers (cfs) for a 100 year flood, questionable mitigation, and construction costs are out of control. As an example, what methodology of measurement will be implemented at specific locations starting in downtown where the Los Gatos Creek, and the Guadalupe River merge near Santa Clara Street, to the Alviso Marina? From past history, the cfs will vary at each location, and it remains to be resolved. What are the real impacts of the pumps, and storm drains (will vary) along the Guadalupe, the available free board will not be the equal (again vary at each location), and these measurements will be a "wild card" by its definition of which pump is to be turned on, and which pump will be turned off?

Prior to the construction of the salt evaporation ponds decades ago, high flood flows were allowed to create a delta of mudflats, high salinity, a tidal prism, hosting thousands of shore and migratory birds, fishery, and habitat nesting, if true restoration is to be made in the South Bay (lower Guadalupe River).

Case in point, it is critical that Pond # 8 (figure #6) be used during a heavy storm event for emergency flood storage as in the past. What are the engineering specifications for the evacuation of those waters if high floods enter into the this pond? There are many options proposed, and an aggressive exit plan must be in place prior to the next storm.

6a

One proposal is to use a mechanical gate from the Guadalupe across from the yacht club and the other to be located at the N/E corner of Pond # 8, that remains to be seen if the storage overwhelms the storage, and flood waters cannot be evacuated prior to the next storm event, and has the potential of flooding the area. Next option (figure #6A) would be to remove sections of the levee to release those subject flood waters back into the Guadalupe River, creating a tidal prism, and the portion of levees left in place would become natural habitat areas not open to the public. This action will re-establish the wildlife habitat, and the fishery, it will increase the available flood storage, tidal flows, the salinity to its original historic level, nesting habitat, and a rest area for migratory, and shore bird feeding. Another option (figure #6b) would be, along the Western side of Pond # 8 there is an existing levee to Calabasas Creek, construct a channel from the Guadalupe to Calabasas direct, as a combination of using Pond # 8 as a flood storage in the first option

6b

6c 6d

The SCVWD Board of Directors and staff, the Alviso Water Task Force, the community USF&WS, and state agencies, must continue to work with the South Bay Salt Pond Restoration Program, by encouraging Pond # 8, be returned it to an historic delta, tidal mudflats, re-establish the salinity in the river, and that is the message which must be communicated to all parities concerned.

Last point, it remains to be seen, when the District made the decision to remove the vegetation above the Gold Street Bridge, it was understood by the Alviso Water Task Force, that the District was to re-visit the vegetation removal up stream at the Gold Street Bridge, when he community challenged the design of side channels along the maintenance roads vs. along the stream improvement (figure # 8), their input was ignored. It must be noted, that in this reach is a migratory corridor for Chinook salmon, and steelhead, these side channels are an entrapment including other fish population, and miscellaneous other species, all become prey from predators during the exit of the tide.

In reality, the re-implementation in vegetation removal above the Gold Street Bridge has failed to improve flood flows, failed to improve fishery, failed to improve the environment, failed to improve a healthy stream etc, is questionable act. Much to the surprise of the Alviso Water Task Force during a meeting, they were told there would be the a change in vegetation removal (see figure # 8), at one side along the stream. Yet, the staff went back, and did the same process, why? It proved to be wrong before, because the mud slides, and the vegetation are moving back into the main stream. In my opinion is a wasteful use of funds, personnel, and experimental engineering.

This duplication of efforts have taken away much needed flood control dollars, which could have been used at other locations. Who or whom authorized this project having full knowledge it would create future fishery problems (Dr. Charles H. Hanson Ph.D. attachment # 7, and Keith Anderson (rt.), State Fish & Game Senior Biologist testimony before the SCVWD Board of Directors on a lower Guadalupe project earlier in 2004)?

In conclusion, the Board of Directors established the Alviso Water Task Force, there has been a lot of hard work by the staff with this group, and under the direction of the District CEO (which he personally has been attending), is making effort to address these issues facing the lower Guadalupe River. However, **"if we do not act like flood control leaders, then we will never become flood control leaders,"** and that is in the spirit this of this letter. As always, if I can be of service in anyway, please do not hesitate to call upon me.

Respectfully submitted,

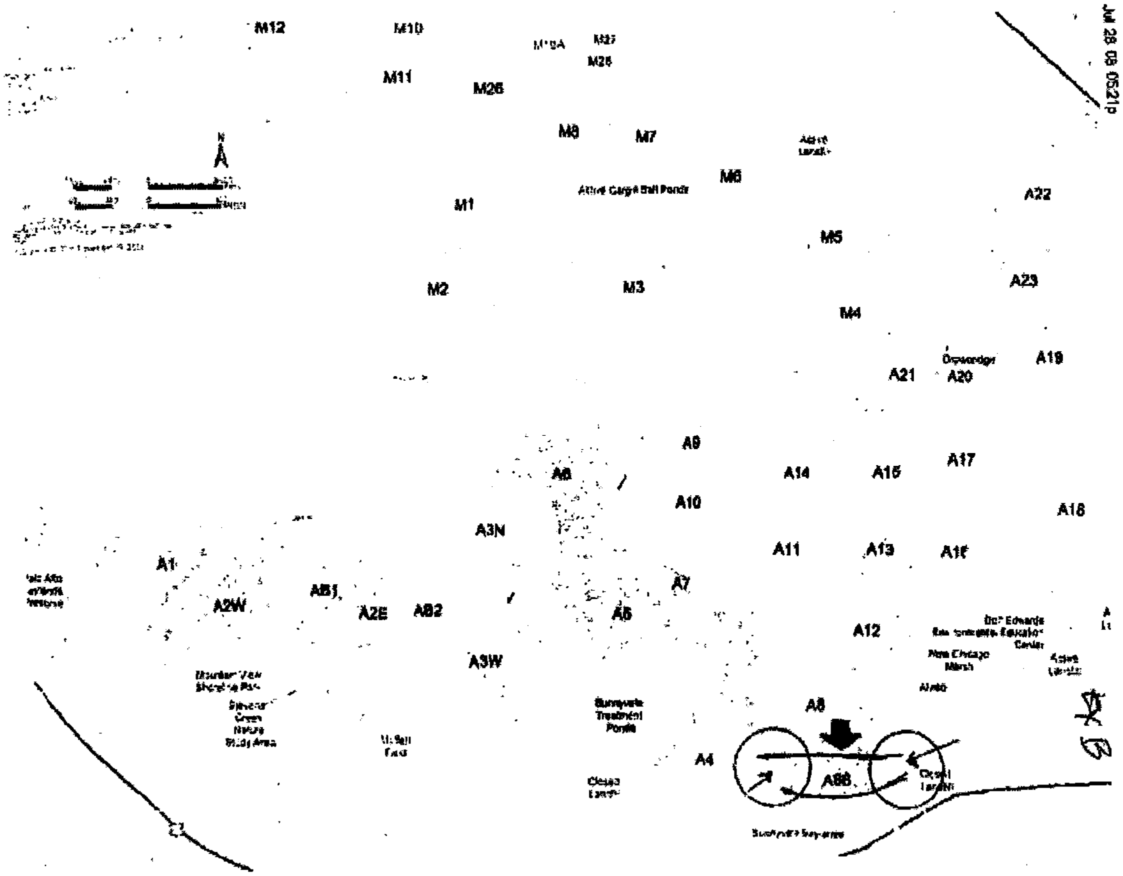
Robert W. Gross Ph.D.

Cc: State Senator Liz Figueroa
State Assembly Sally J. Lieber
SCVWD Board of Directors
SCVWD Stan Williams CEO
SCVWD Jim Fiedler
SCVWD Rick Callender
USF&WS - Clyde Morris - Refuge Manager
SFBCDC
South Bay Salt Pond Restoration Program - Steve Ritchie, Executive Program Mgr.

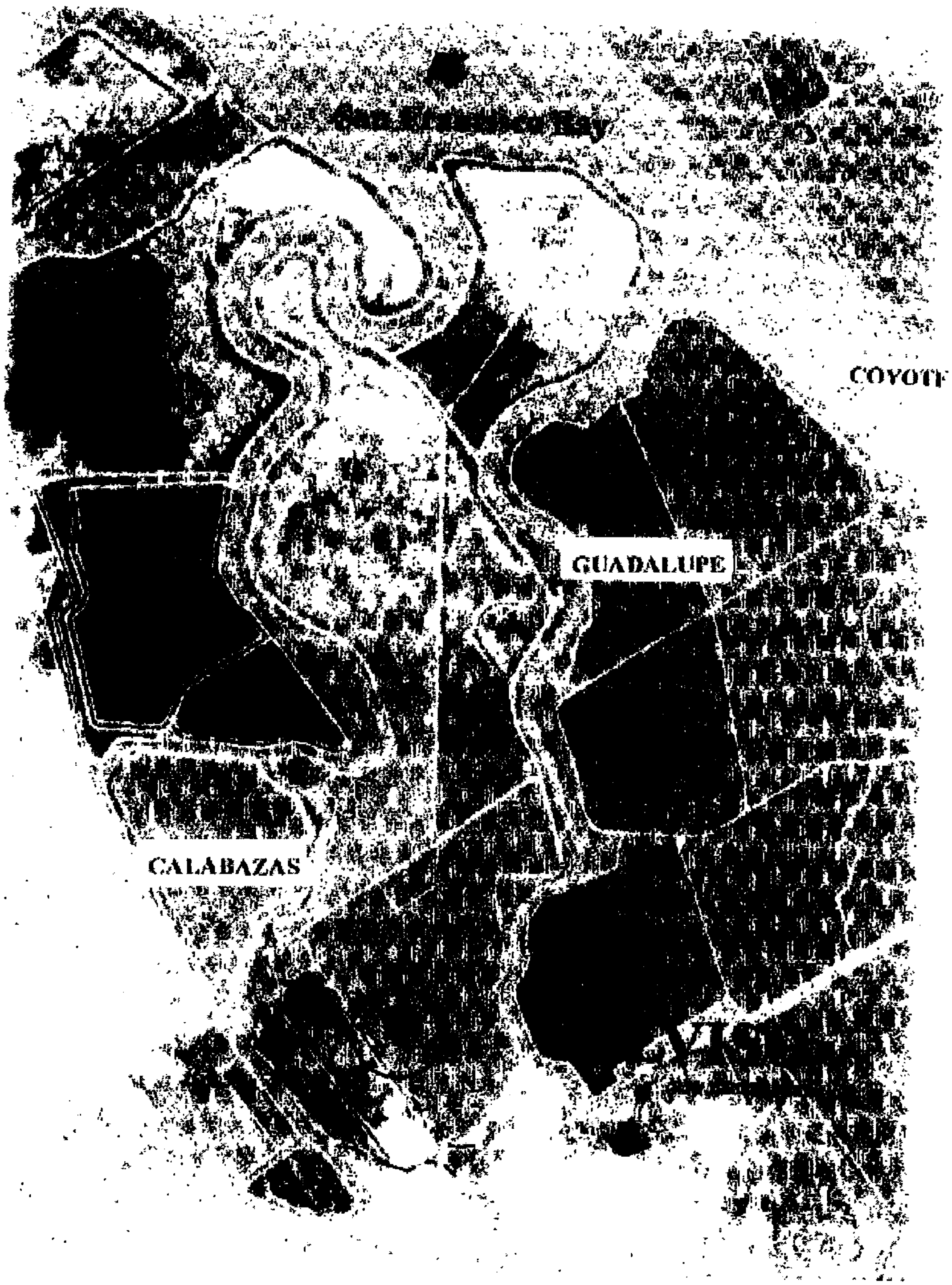
Attachments - (first page only attachments 1-5 & 7, copies available at SCVWD)

1. SFBCDC Permit No. M83-31 to SCVWD 1983
2. SCVWD Negative Declaration Project # 3015 1983
3. Harvey & Stanley Associates - Biological Baseline Guadalupe River 1982
4. SCVWD Negative Determination Dr. Bernie Goldner Ph.D. 1983
5. SCVWD Summary of Appeal to SFBCDC - Permit No. M83-31
6. Air photo Pond # 8 - Alviso & lower Guadalupe River
7. Assessment of Potential Fishery Habitat Benefits/Adverse Effects of Proposed Vegetation Removal and Tidal Enhancement within Lower Alviso Slough
8. Opinion how the staff constructed the project vs. how the staff should approached the problem. (R.W. Gross Ph.D.)
9. Levee profile concept (R.W. Gross Ph.D)

Jul 28 08 05:21p

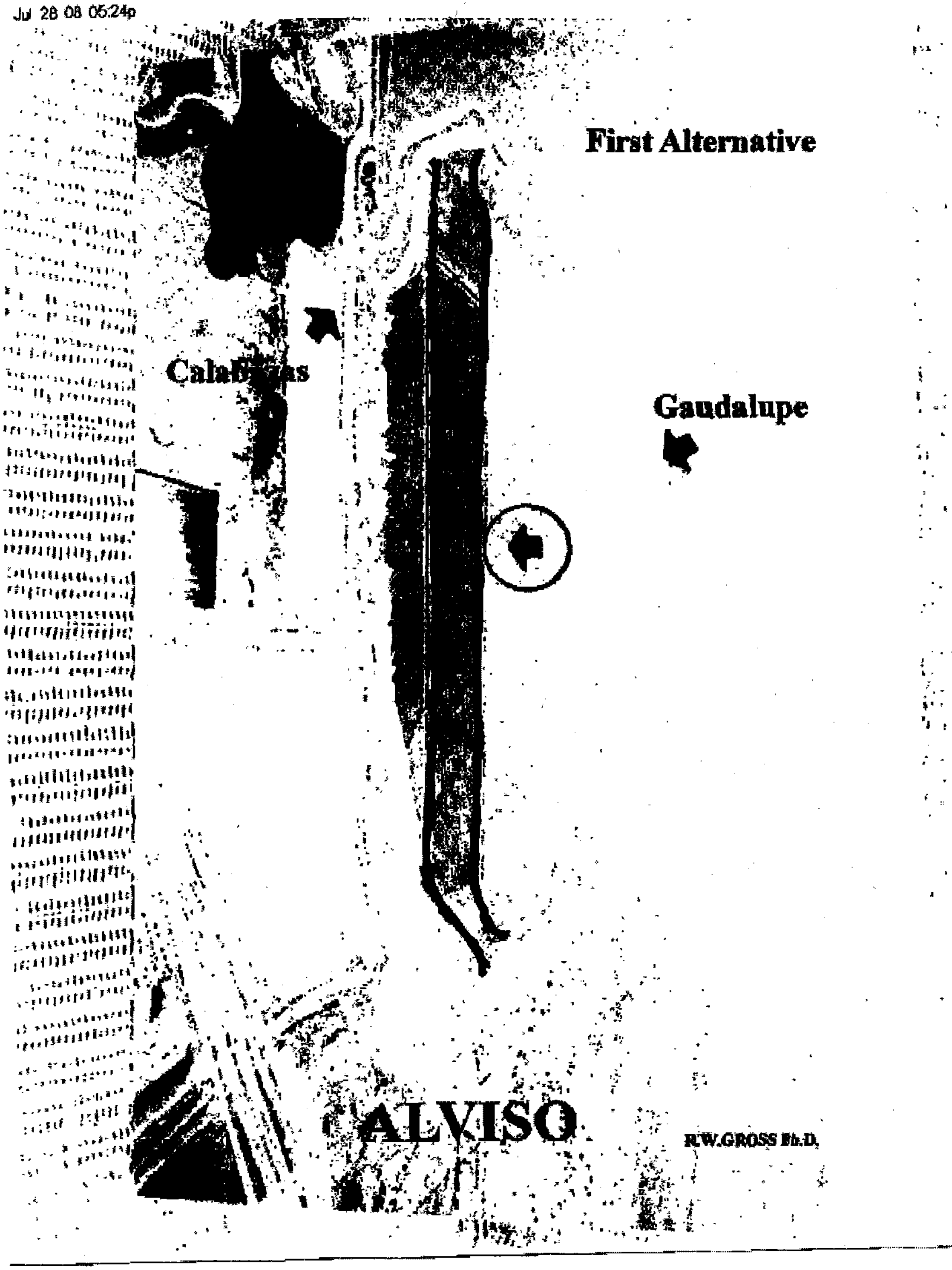


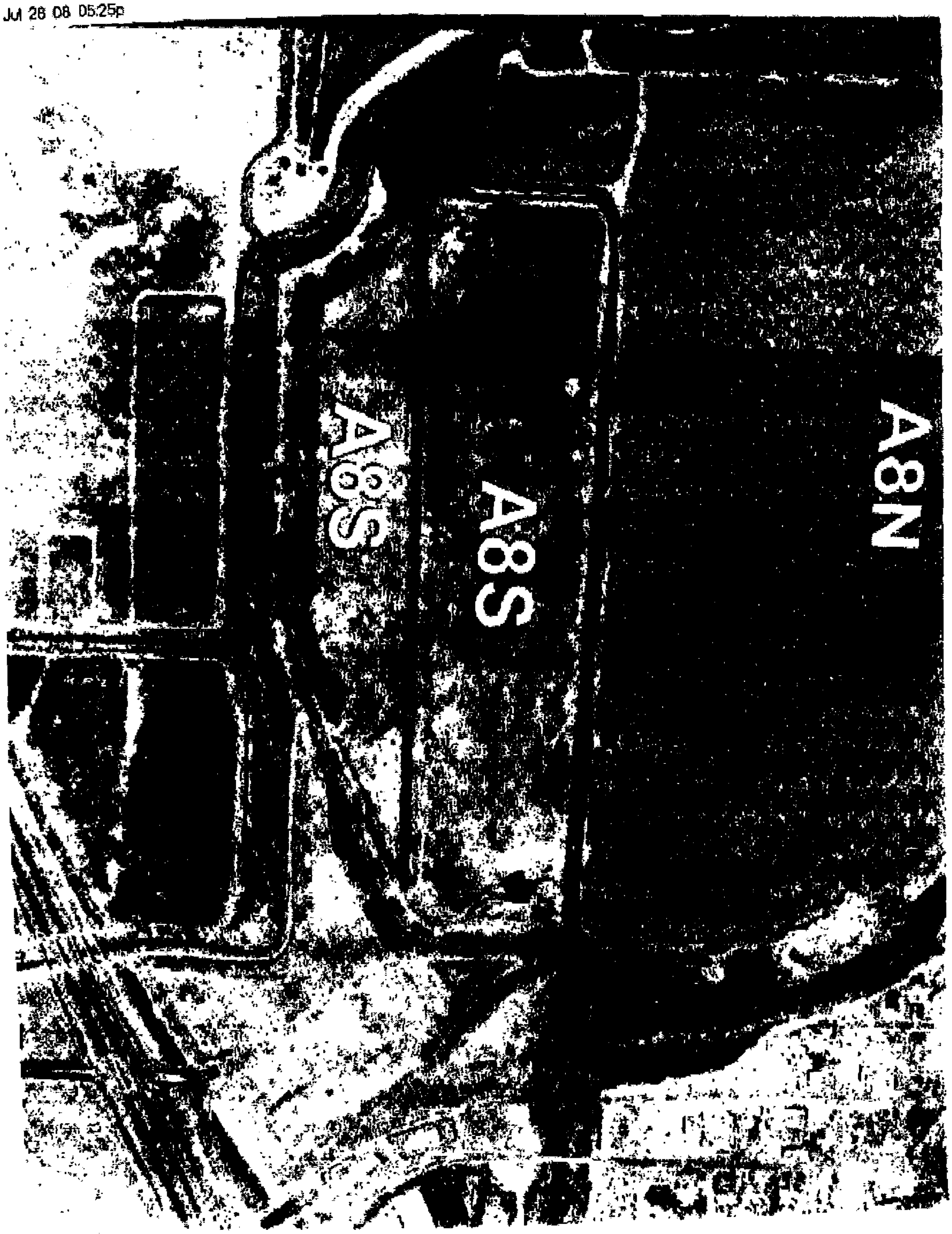
p.16


COYOTE
GUADALUPE
CALABAZAS

p.18

Jul 28 08 05:24p




A8N
A8S
A8S

Jul 28 08 05:29p p.20

EX C

Winter 2004-2005
San Francisco Bay National Wildlife Refuge Complex

Volume 24, Number 4

In the Trenches with Invasive Spartina

Coastal Conservancy Program Launches Bay-wide Assault on Hearty Marsh Invader

By Peggy Olofson

Beleaguered marsh managers and concerned environmentalists found reason for renewed optimism, and even some celebration, this fall. After years of disheartening delays and frustration, a coordinated regional attack on non-native *Spartina*, an invasive cordgrass that has established in the San Francisco Bay, finally got underway. On September 2, 2004 with the signing of the last environmental authorizations by the U.S. Fish and Wildlife Service (USFWS), the San Francisco Estuary Invasive *Spartina* Project (ISP), a program of the State Coastal Conservancy, launched an attack on 450 acres of tenacious weeds present in the Bay.

"If we had done this work two years ago," laments ISP Field Operations Manager Erik Grijalva, "we'd have knocked out most of the non-native *Spartina* population in the Bay!" As it is, Grijalva and the ISP partners are well aware that they have a tough battle ahead of them for the next several years. Although 450 acres may seem like a monumental battlefield, it is only 23% of what is actually out there. Even if this year's treatment were 100% successful, at the current rate of spread, the plant may cover as many as 3,000 acres of the Bay's tidal marshes and mudflats by treatment time next year – 1,000 acres more than was estimated at the beginning of this year.

"But at least now we have a program," says Alameda County Flood Control District's Saul Ferdan. "At least now there's a little less probability that the areas we cleared this year will be completely reinfested by seed from a neighbor's untreated marsh."

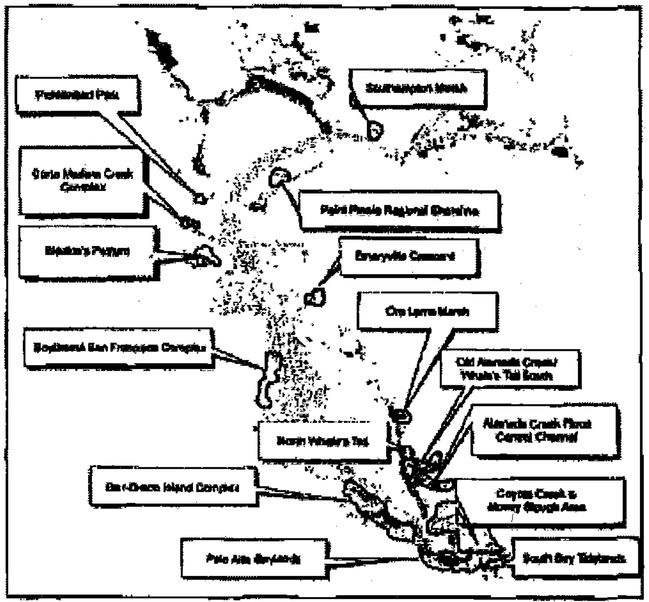
Origin of the Invasion

Four species of non-native *Spartina* were introduced to the San Francisco Estuary in the

Continued on page 2

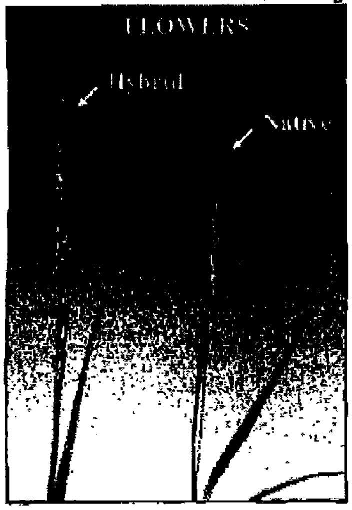
Map of 2004 *Spartina* Treatment Sites

ISP chart


Point Pinole Regional Shoreline
Emeryville Crescent
Oro Loma Marsh
Old Alameda Creek/ Whale's Tail South
Alameda Creek Flood Control Channel
North Whale's Tail
Coyote Creek & Mowry Slough Area
Palo Alto Baylands
South Bay Tidelands

Coastal Conservancy Program Launches

1960's and 70's -- at least three intentionally by well-meaning landscapers and restorationists (see "Good Intentions Gone Awry," by Phyllis Faber, in the Conservancy's California Coast and Ocean, Summer 2000 issue). Two of the species, English cordgrass (*S. anglica*) and dense-flowered cordgrass (*S densiflora*), were planted as part of a landscaping project at Creekside Park in Marin County. Both these species have remained relatively localized along Corte Madera Creek and the Marin shoreline, but dense-flowered cordgrass, a native to Chile, has spread along the entire length of the Creek and begun migrating to other areas in the northern Central Bay. Salt-meadow cordgrass (S. patens), a native of Atlantic salt marshes, is of unknown origin in the Bay, and is found only at Southampton Marsh near Benicia.



Superior pollen production and fertility enable hybrid Spartina to "swamp" native flowers with pollen, causing native plants to produce entirely hybrid offspring.

ISP illustration

The fourth species, Atlantic smooth cordgrass (*S. alterniflora*), also from the Atlantic coast, was introduced as part of a marsh restoration experiment at a salt pond on the Alameda County shoreline. This species eventually cross-pollinated with native Pacific cordgrass (*S. foliosa*), and the hybrids created soon evolved into an aggressively expanding "hybrid swarm". Researchers at University of California found that the hybrid cordgrass produces pollen in much greater abundance (21 times greater) and with higher fertility than native cordgrass. It would overwhelm or "swamp" native cordgrass flowers, thus producing huge volumes of hybrid seed. The hybrid seeds are able to establish not only in areas suitable to Pacific cordgrass, but also in extreme areas, such as wave-washed open mudflats, high marsh, and freshwater creek channels.

"I've got one growing in my backyard in Oakland," confides Grijalva, "and it's doing great!"

It is because of this very high productivity and ability to grow just about anywhere in the tidal spectrum that the *Spartina* hybrid swarm may be the most significant threat to San Francisco Bay's marsh ecosystem since human development.

Beautiful blight

A characteristic of hybrid *Spartina* that sometimes makes garnering public support for its control more difficult is that it's quite an attractive, lush green grass. In some areas, hybrid Spartina meadows have been established for 10-15 years. Nearby residents consider them a lovely part of their afternoon walk, little suspecting the underlying havoc being wreaked on the ecosystem. The potential long-term ecological effects of non-native Spartina are significant, including the following:

- Extensive regional loss of tidal flats – Almost half of the 19,000 acres of existing tidal flat in the South and Central bays may become dominated by hybrid *Spartina* in less than 10 years if it is not successfully controlled.
- Elimination of critical foraging habitat for resident and migratory birds – With the loss of tidal flats comes the loss of critical foraging areas for all sorts of birds. The mudflats would become dense monoculture meadows, with no foraging value for many important species.
- Failure of planned South Bay salt pond restorations to restore native tidal marsh that supports target species – Every one of the 33 tidal marsh restoration projects implemented in the Central and South bays in the last 20 years has become dominated by *Spartina* hybrids that are fast becoming monoculture meadows. Until nearby hybrid populations have been removed and hybrid pollen sources eliminated, the Spartina Project estimates that new tidal marsh restoration efforts will achieve the same end.
- Genetic assimilation, and extinction, of native Pacific cordgrass (*S. foliosa*) – As described above, the *Spartina* hybrid swarm easily overwhelms native Pacific cordgrass, swamping the native flower with hybrid pollen and precluding the native plant's ability to reproduce itself. At the rate this phenomenon occurs, it would be only a few short years before Pacific cordgrass, the keystone species of our estuarine tidal marsh system, becomes locally and perhaps regionally, extinct.
- Loss of flood control capacity – Flood control agencies in the South and Central bays have become increasingly concerned as they watch hybrid *Spartina* become dominant in important flood water conveyance channels, causing highly accelerated sediment accretion and loss of channel capacity.
- Marginalization of endangered species habitat – Although it is not always evident in the short term, the spread and domination by hybrid *Spartina* on mudflats and mid to high tidal marsh is expected to adversely affect many endangered tidal marsh species, including the California clapper rail, salt marsh harvest mouse, California

Bay-wide Assault on Hearty Marsh Invader

sea-blite, and soft bird's-beak.

For more information on other consequences of the unchecked spread of non-native cordgrass, see the *Spartina* Project's *Programmatic Environmental Impact Statement/Report* and "A Review and Assessment of Potential Long-term Ecological Consequences of the Introduced Cordgrass *Spartina alterniflora* in the San Francisco Estuary" (Bayo 2004).

Spartina history on the Don Edwards San Francisco Bay National Wildlife Refuge

Refuge Wildlife Biologist, Joy Albertson, was among the first marsh managers in the San Francisco Estuary to initiate serious action against non-native *Spartina*. "We first started noticing this grass coming into the newly-restored Ideal Marsh in 1990," recalls Albertson. "We didn't think too much about it until it showed up suddenly south of the Dumbarton Bridge, at La Riviere Marsh, another restoration site. We soon could see that the seeds from northern sites were establishing very rapidly in the newly forming marshes. Once they were established in the new marsh, we began to see seedlings showing up in the surrounding native marshes."

When asked how she knew this plant was a problem, Albertson explains: "There were some reports circulating at that time . . . that warned that non-native *Spartina* was potentially a serious problem, and we just took it seriously."

In 1991-92, Albertson was relying on mowing and tarping to control small, isolated patches of non-native *Spartina*. By the mid-1990s, she was using glyphosate herbicide, and reaching out to marsh managers to the north. "We could see that we were just going to keep being invaded, so we started asking the Alameda County Flood Control Agency to control the Spartina in Alameda Creek Flood Control Channel.

Refuge control work has definitely expanded since the days of isolated patches. Partially funded by a $151,000 grant from the State Coastal Conservancy, the refuge was able to treat the entire San Mateo County shoreline between the two bridges, as well as La Riviere Marsh and Mayhew's Landing. "The big thing," according to Albertson, "is that we continue to get everyone to participate in coordinating control – and we have to keep our priorities straight. There's only so much we [the refuge] can do if other marsh managers don't do anything."

The battle plan

ISP Field Operations Director Grijalva feels optimistic after this year's efforts and has high hopes for the future: "Things went pretty well for our first year; we succeeded in getting a strong program structure in place, including dozens of partnerships, avenues to future funding, and increased public awareness, in addition to treating almost 400 acres of cordgrass."

By next season, Grijalva would like to have control plans and partnerships in place for all of the remaining 2,000-plus acres of non-native cordgrass, treating at least half of it, in addition to re-treating all of the areas that he hit this year. "It's an ambitious plan," admits Grijalva, "but it's possible, and more importantly, I think it's necessary if we are going to be successful."

Like Albertson, Grijalva is adamant that the key to successful *Spartina* control and healthy marsh restoration lies in a unified assault by the marsh managers: "Either you recognize the need for controlling non-native Spartina and help deal with it, or else you better reevaluate your definition of a healthy marsh system."

The ISP has thus far been funded primarily by the CalFed Bay-Delta Program and the Coastal Conservancy. The Conservancy is continuing to take the lead in acquiring funding for the ISP. At this point, a potential $3 million has been identified for operations over the next several years, and other sources are being sought. The Conservancy, CalFed, University of California, and the San Francisco Bay Joint Venture sponsored the Third International Conference on Invasive *Spartina* in November this year in San Francisco. The conference brought together international experts to advise on the San Francisco non-native Spartina Invasion. For conference information, abstracts, and proceedings, visit www.the-conference.com/2004/Spartina/.

For more information, contact: Peggy Olofson, Director, San Francisco Estuary Invasive *Spartina* Project, 605 Addison Street, Suite B, Berkeley, CA 94710 Phone: 510-548-2461 Email: prolofson@Spartina.org

Peggy Olofson is the owner of Olofson Environmental, Inc., and Director of the San Francisco Estuary Invasive Spartina Project. For 10 years prior to accepting the contract as ISP Director, Ms. Olofson was an engineer for the San Francisco Bay Regional Water Quality Control Board, where she served as Manager of the San Francisco Bay Area Wetlands Ecosystem Goals Project and editor of the Baylands Ecosystem Species and Community Profiles. She lives in Oakland with her two teenage children.

Spartina Project Partners

Alameda County Flood Control District

California Department of Fish and Game

California Department of Parks and Recreation

California Department of Transportation

City of Palo Alto

Don Edwards San Francisco Bay National Wildlife Refuge

East Bay Regional Parks District

Friends of Corte Madera Watershed

Golden Gate Audubon

Marin Conservation Corps

Mid-Peninsula Open Space District

San Mateo County Mosquito Abatement District

Santa Clara Valley Water District

Tiburon Audubon Center

Ex D

Thomas Laine
P. O. Box 543
Alviso, CA 95002

November 7, 2006

To: Alviso Water Task Force

RE: Native Salt Water Species

Per your request the following is a list of the salt water species that were native to the Alviso Slough at the South Bay Yacht Club area until at least 1968.

Mud clams
Soft shell clams
Mussels
Rock Crabs
Dungeness Crabs
Pile Worms
Salt water snails
Bullheads
Longjaw mudsuckers
Silver smelt
Perch
Shiner perch
Anchovies
White fish
Spanish mackerel
Herring
Pipe fish
Flounders
Striped bass
Jack smelt
Leopard shark
Sand shark
Stingrays
Bat rays
Sturgeon
Grass shrimp
Pile shrimp
Barnacles

This area was a nursery for all these species.

Thomas Laine

Thomas Laine

This is only a few of birds, along with migratory and shore birds, which have almost totally disappeared along the shores of the Guadalupe due the lack of maintenance of the river.

ALVISO has been known for decades the return of the swallows, and historically hosted six, a few decades ago, the swallows would return by the thousands, today, it is around several hundred. The birds would gather both food [insects] and the bay mud for their nesting from the Guadalupe when the tide is out. Today, it is a complex of fresh water non-native vegetation, destroying its natural habitat.

Barn Swallow	Hirundo rustica
Cliff Swallow	Hirundo pyrronota
Northern Rough Winged Swallow	Steigidopteryx serripennis
Violet green Swallow	Tachycineta harass
Bank Wallow	Riparia riparia
Tree Swallow	Tachycineta bicolor

Also, many of the owls have slowly disappeared due to the food supply along the Guadalupe banks.

Robert W. Gross Ph.D.

Response to Robert W. Gross (RWG)

General Response: The District appreciates the information provided in the packet sent by Dr. Gross.

RWG-1: Comment noted. The Draft Engineer's Report for the proposed project evaluated the alternative of restoring the historic Guadalupe River Channel through what is now Pond A8. As described on p.4-2 and 4-3 of the Draft Engineer's Report, this alternative is not feasible at this time.

RWG-2: Historically, tidal marshes were the dominant habitat throughout much of the South Bay. The vast area dominated by marshes included Alviso Slough, in the lower reaches of the Guadalupe River. The Slough, subject to tidal action, had abundant water flow in from, and out to, the Bay. This water flow continually scoured the channel and kept it relatively free of sediment build-up. Prior to the 1940s, Alviso Slough was a broad channel with an extensive salt marsh on either side. After levees were built in the 1940s to create salt ponds, the dynamics of water flow in the channel began to change. The levees sealed off much of the South Bay from tidal action and in turn water flow in the Slough decreased, causing the channel to fill in with sediment.

In the 65 or so years since the construction of the levees, Alviso Slough has undergone dynamic changes, both physical and biological. After the levees were built, groundwater pumping led to subsidence throughout the region. As a result, land around the town of Alviso sank up to 10 feet. In the Slough, this sinking caused the channel to deepen to a point where it could no longer sustain marsh plants. Additionally, the levees themselves sank. The District and the salt pond operators repeatedly raised the height of the levees to counteract this trend. Subsidence began to slow starting in 1965 and the channel slowly refilled with sediment, though it took years for marsh plants to reestablish. The resulting newly established vegetation helped accelerate the process of sedimentation.

Alviso Slough in the Project area has silted in, but not with *Spartina*. Substantial mudflat development and *Spartina* colonization has occurred in Coyote Creek and at the mouth of Alviso Slough. Recently, California bulrush (*Schoenoplectus californicus*), a freshwater marsh species, has colonized the low-marsh zone in the Project area. While it is a native plant, it did not occur in this portion of Alviso Slough until the past 20 to 30 years.

RWG-3: The fisheries have changed as the tidal prism, salinities, and extent of open water have been reduced over the years, as the EIR describes. With respect to the swallows, the large colony that formerly supported hundreds (possibly over a thousand) birds at the old water tower disappeared when the tower was removed. Similarly, the colony on the Gold Street Bridge has been greatly reduced for reasons unknown. This could possibly have been a result of raising the bridge higher above the water for the flood protection purposes, vegetation changes in the channels, or it may have been an overflow colony from the old main colony and disappeared with the main colony.

RWG-4: Comment noted.

This page intentionally left blank.

LL3

Libby Lucas 8_11_08.txt

From: JLucas1099@aol.com [mailto:JLucas1099@aol.com]
Sent: Saturday, August 09, 2008 8:27 AM
To: Mike Coleman
Subject: Alviso Slough Restoration Project - DEIR and Draft Engineer's Report

Michael F. Coleman, Environmental Planner

Santa Clara Valley Water District

5750 Almaden Expressway

San Jose, CA 95118

Dear Michael Coleman,

In rereading my earlier comments to you in regards the Alviso Slough Restoration Project DEIR and Draft Engineer's Report realize that I neglected to ask exactly where this project could impact Congdon's Tar Plant by dumping of dredge spoils, as stated in report's probable environmental impacts. LL3-1

Had intended to do field trip to Sunnyvale Baylands where colony of Congdon's Tar Plant has been noted but that cannot be area that dredge spoils will be deposited?

Can you clarify this aspect of the project's environmental impacts for me?

Thank you so much.

Libby Lucas

174 Yerba Santa Ave.,

Los Altos, CA 94022

Looking for a car that's sporty, fun and fits in your budget? Read reviews on AOL Autos.

This page intentionally left blank.

Response to Libby Lucas (LL3)

LL3-1: Staging Sites were selected in areas of pre-existing impacts. The EIR Section 3.4.3 indicates that areas proposed for the stockpiling of material would be surveyed immediately prior to use. If special status plant species were located, an alternative stockpiling site would be utilized, or protective fencing would be installed around the sensitive plants. These measures are outlined in Section 3.4.3 under Mitigation Measure TERRBIO-D (found on page 3.4-43 of the Final EIR).

This page intentionally left blank.

RR

Russ Robinson
10825 W. Estates dr.
Cupertino, CA 95014
408-253-2529
russ1011@ix.netcom.com

15 July 2008

Katherine Oven
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118-3686

Reference: Alviso Slough Restoration Project, Draft Environmental Impact Report (DEIR) Dated May 2008

State Clearinghouse No. 2007082071

I am pleased to present these comments on the referenced DEIR. This project has been needed for years and it is a credit to the SCVWD that they have finally recognized that the Alviso slough cannot go on without maintaince and attention. The report graphically shows that the channel has become increasingly clogged with non-native vegetation and silt. The vegetation now growing unchecked in the channel is the type of vegetation that grows in fresh and brackish waters. Historically that area of the slough was salt water where as today excessive amounts of fresh water exists and promotes the weed growth.

As an active member of the South Bay Yacht Club I have worked for many years to maintain the club's historic location in the Alviso Slough/Guadalupe River. The presence there goes back to before the 1900's when the club was formed in 1888 and incorporated in 1896. Their presence was noted in an act by the Secretary of War under Section 10 of the Rivers and Harbors Act of 1899. In 1905 the Secretary of War granted the club the right to have a wharf in the slough. Over the years that right has been overlooked and ignored by the predecessors of the present Santa Clara Valley Water District for this and previous projects. In addition the slough has had extensive realignment, which, in part has led to the present condition. The Rivers and Harbors Act of 1899 should be reviewed in detail to see that the Act is being complied with in this project, the rights of the South Bay Yacht Club are addressed and that the Act was applied in the previous projects in this area. The existence of the wharf is noted on a framed map on the wall inside the SBYC clubhouse and is shown partially in a historic photo taken in 1914 –Figure 7 Historic Photos of the South Bay Yacht Club.

Alternative 5 comes closest to meeting the project objectives and is the staff recommendation while most of the other alternatives given do not come close to meeting the objectives stated in the desired outcome, those mainly being to return the slough in the project area to the early 1980's condition. It is clear that only cutting the weeds down 4 feet may not meet the objectives and the problems associated with obtaining permits for additional work might make it near impossible to restart this project. It seems prudent to work toward a middle ground alternative that includes the weed removal and some dredging. By doing so more latitude can be achieved to design the project toward reaching eventually the overall projects stated objectives. A combination of Alternative 2 and Alternate 3 seems to provide that latitude. Alternate 5 is costly but if viewed as restoration of an area that has been ignored for well over 40 years, then the cost of deferred maintaince per year is small. The money was saved in all of those years by not doing any work in the slough; perhaps it is time now to correct that problem.

The following specific questions are asked for clarification:

Page ES-3 Range of Alternatives—What constitutes an "active pier or dock"? Some docks at the SBYC have become unusable due to the heavy silting and vegetation growth but the club still considers them "active" and is paying for a lease with the SLC and the SCVWD to have a continued right to use them. RR-1

Page ES 11–Mitigation for the removal of the vegetation seems unwarranted at this time. Removal of the weed mass will return the area to what was there in the 1980's when abundant shorebird s were present. At the present time few critters abide in the tangled Bulrushes and Tulles The South Bay Salt Pond Restoration Project directly across for this area of the Alviso Slough in Pond A8 is not held to a mitigation standard as it is restoring the area to what existed there years before. RR-2

Page ES 12—Environmentally Superior Alternative—I disagree that Alternative 1 is "environmentally superior". It, like the No Project Alternative, does little on a long-term basis to return the slough to it former greatness. In complete fairness the Alternative 5 does that best but could be too costly to achieve. RR-3

Page 2-3—2.3.1—The objective is to remove the entire root mass. If 4 feet is adequate then that is as far as they should be removed. If however they extend below the 4 feet level their removal should be done so that all roots are removed. These plants are propagated from portions of the roots and all should be removed. RR-4

Page 2-6—2.3.3—All abandoned vessels on the SBYC leased properties should be removed well in advance of the start of this project. As stated earlier in this report the SBYC does not consider any of their docks "abandoned". RR-5

Page 2-7—Staging/Stockpiling areas and Local Haul Roads—The aerial view shows the haul road crossing the railroad tracks at Taylor Street. There is no crossing there and there is no ramp down the levee on to Taylor Street at that point. A suggestion would be to proceed on the top of the levee to the ramp at the end of Catherine and exit down to street level there or if a lower surface route is desired to proceed onto city streets at Taylor and Hope then up to Catharine, right on Catherine to El Dorado and right turn to Gold Street. RR-6

Page 2-27—2.7 Staff-Recommended Alternative. —I completely disagree that the maintainability of the project should weigh so heavily as it appears that Alternative 1 does. The work in the slough has been ignored for years and now it is proposed to restore it. RR-7

Page 3.1-1 Applicable Plans and Policies –USACE – As previously stated it is unclear if the Rivers and Harbors Act of 1899 has been followed in previous projects. The present design created by river realignment and the failure to place a levee inboard of the existing one across the Alviso slough has created a catch basin for silt. That aspect should be reviewed to determine if dredging the river to a greater depth and moving the levee closer would promote the scouring of RR-8 the channel as it had done before the realignment many years ago. ↑ RR-8

Page 3.3-37 (and elsewhere in report) Boating Impact—I concur that increased boating activity will have little if any impact on the shoreline. The Department of Boating & Waterways conducted tests in the Delta to determine exactly that kind of impact. Their studies showed that small boat traffic had little impact. Large Ocean going tugs and vessels however did have an impact as well as wind driven waves. None of these impacts will occur in the project area. RR-9

Page 3.17 Socioeconomic Factors—South Bay Yacht Club—An enhanced public access is planned for access at the South Bay Yacht Clubs docks as part of the club's lease with the State Lands Commission. Dock rental space costs are extremely low at the clubs facilities due to the existing poor access conditions in the slough. RR-10

Now some additional comments on the Draft Engineers Report:

Page ES-1-- In the first paragraph no mention is made of the increased siltation that has been exacerbated by the non-native vegetation.

Page ES-1—No mention is made about restoring the channel width and DEPTH to the pre-1983 conditions.

Page ES-4—A cost estimate is included in the estimated capitol expenses for $250,000 to remove the abandoned vessels. All such vessels will be removed from the South Bay Yacht Club leased properties by the time this project is started and those on the Districts property should also be gone. This cost estimate should be removed. Leaving it there brings the other estimates into question. RR-11

Page 2-11—Biological Resources 2.4.1—It is noted that in the report that excessive amounts of fresh water are in the project area. Some effort should be made to limit this flow if it is in the SCVWD's power to do so.

Finally, the project makes no mention of the existing failed trash booms just upstream from the SBYC docks. In 1995 these failed and a huge amount of debris was caught behind the SBYC docks. This project must correct that design deficiency and add effective trash racks so that the floating material is diverted into the main stream.

Respectively submitted,

Russell H. Robinson

Staff Commodore, South Bay Yacht Club

This page intentionally left blank.

Response to Russ Robinson (RR)

RR-1:	Active piers or docks are those that were in use at the time of the Draft EIR publication (i.e., May 2008) as well as those docks that have the potential for use once silt and vegetation growth have been removed as a result of the project.
RR-2:	Comment noted. Per the EIR Impact AQBIO-4 and mitigation measure discussions for AQBIO-A and AQBIO-B, mitigation measures are intended to minimize construction-related habitat disturbance.
RR-3:	Comment noted. Of the action alternatives, the "environmentally superior alternative" was identified as the alternative that had the smallest footprint, thereby minimizing direct impacts to wetland vegetation, minimizing the need for extensive truck trips to the disposal facility, and minimizing the need for large staging/stockpiling areas for sediment drying. In addition, the footprint of Alternative 1 is located within the estimated two to five acres that would scour over the next 10 years as a result of a successful SBSP Restoration Project Phase 1 Action, which would reduce, or could even eliminate the need for ongoing maintenance by the Alviso Slough Restoration Project in this area. A reduced or eliminated need for ongoing maintenance due to a successful SBSP Restoration Project Phase 1 Action would decrease future direct and indirect impacts while still providing the desired benefits to Alviso Slough.
RR-4:	Comment noted. Per Final EIR (pages 2-17 and 2-19), the actions in Alternative 5 were developed to mimic the slough's depth and open-water channel width in approximately 1983. Alternative 5 would include dredging to 10-foot depth.
RR-5:	Comment noted. All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by BCDC, California State Lands Commission (CSLC), the District, or SBYC by the time of commencement of construction of this Project (Final EIR page ES-3).
RR-6:	Comment noted. Figure 2-7 has been revised accordingly.
RR-7:	Comment noted. Please see response RR-3 above regarding the merits of Alternative 1.
RR-8:	The Rivers and Harbors Act is mentioned on page 3.1-1 in the Final EIR.
RR-9:	Comment noted.
RR-10:	Comment noted.
RR-11:	Comments made on the Engineer's Report are noted.

This page intentionally left blank.

Final Environmental Impact Report

Executive Summary

BACKGROUND

Alviso is an historic town at the edge of San Francisco Bay, now incorporated into the City of San Jose, California. The Alviso Slough Restoration Project (Project) area is situated on the banks of Alviso Slough between the Gold Street Bridge and the Alviso County Marina in the lowest reach of the Guadalupe River. The slough continues several miles downstream before it enters San Francisco Bay. Historically, the reach was used for navigation, recreational boating, and public access. The Alviso Marina County Park and former salt ponds, which are now part of the Don Edwards San Francisco Bay National Wildlife Refuge, surround the Alviso area.

Alviso Slough has experienced a gradual decline in channel width and overall depth due to sediment accumulation and vegetation encroachment over the past 25 years. These conditions are the cumulative effect of a myriad of human activities in the South Bay marshes and waterways over the past 150 years. In the 1850s, a man-made channel was excavated to connect Guadalupe River to what was then referred to as Steamboat Slough (now known as Alviso Slough). In the 1940s, the South Bay marshlands and drainage channels were manipulated and diked for salt-making (evaporator ponds) and agricultural purposes, severing the Guadalupe River from its natural course to the Bay, and constraining the flow of Alviso Slough. Groundwater over-pumping and the resulting land subsidence in the early to mid-20th century, the realignment of the Guadalupe River channel for more efficient flow conveyance in the 1960s and 1970s, and urban development in the watershed all further constrained and impacted the natural watercourse of the river and the slough. These anthropogenic influences, combined with natural processes that have attempted to reestablish ecological equilibrium, have resulted in a reduced channel width and depth that affects the historical uses of the slough for navigation and recreational access.

DISTRICT GOVERNANCE

The Santa Clara Valley Water District (District) is a public agency organized under state special district provisions and the Santa Clara Valley Water District Act.[1] The Act establishes a Board of Directors (Board~~BOD~~) to set policies, determine revenues and expenditures, and monitor the achievement of its purposes. In connection with carrying out water and flood management the District may undertake activities that enhance, protect, and restore streams, riparian corridors, and natural resources.[2]

To this end the Board~~BOD~~ has adopted policies that emphasize the District's commitment to a "...enhanced quality of living in Santa Clara County through watershed stewardship and comprehensive management of water resources in a practical, cost-effective and environmentally -sensitive manner."[3] Specifically, the Board has declared its commitments to fulfill this mission through its Ends policies:

> 3.2 Environmental Enhancements are implemented to improve watersheds, streams, and the natural resources therein.

---

[1] District Act, Chapter 1405 of the Statutes of 1951, as most recently amended by Chapter 279 of the Statutes of 2006)

[2] District Act § 4(c)(7).

[3] Ends Policy 3.1, Governance Policies of the Board of Directors, 1999.

3.3 There are additional trails, parks, and open space along creeks and in the watersheds when reasonable and appropriate.

PROJECT OBJECTIVES

In 2004, the District Board~~BOD~~ directed District staff to develop a project to remove vegetation and root mass from Alviso Slough between the Gold Street Bridge and the Alviso Marina County Park and, in the following year, to implement a long-term project to re-establish the saltwater connection to the Lower Guadalupe River. A Project Plan for the Alviso Slough Restoration Project was subsequently prepared in collaboration with the Alviso and Lower Guadalupe Collaborative (ALGC). The Plan provides a history of the project, establishes project objectives, and defines a proposed scope of work, schedule, and costs for the project.

Project objectives aid in identifying a range of suitable and feasible project alternatives. Based on the 2004 Board directives, and working in a collaborative effort with members of the Alviso community, the following project objectives were established:

- Restore Alviso Slough's channel width, and habitat to prior to 1983 conditions;
- Improve the community's ability to pursue navigation, public access, and aesthetics to allow for the expansion of boating and other recreational and/or tourism opportunities;
- Maintain one percent flood protection in Alviso Slough;
- Reduce mosquito nuisance; and
- Promote the integration of the Alviso Slough Restoration Project with the South Bay Salt Pond (SBSP) Restoration Project (including the SBSP Phase 1 Action at Pond A8) to re-establish the saltwater connection to the Lower Guadalupe River.

RANGE OF ALTERNATIVES

A range of alternatives for evaluation in this EIR was determined based on the following considerations:

- Project objectives;
- Sustainability;
- Environmental factors, including regulatory permitting requirements;
- Community feedback; and
- Engineering feasibility.

After a thorough review of a range of potential actions, six feasible alternatives (each a possible project) were selected for detailed study in this ~~Draft~~ Final Environmental Impact Report (EIR), including the required No Project Alternative. The Alternatives evaluated in this EIR are:

- Alternative 1: Vegetation and Root Mass Removal (2.6 acres) to a 4-foot depth;
- Alternative 2: Vegetation and Root Mass Removal (7.0 acres) to a 4-foot depth;
- Alternative 3: Vegetation and Root Mass Removal and Dredging (3.7 acres) to an 8-foot depth;
- Alternative 4: Vegetation and Root Mass Removal and Dredging (6.2 acres) to a 16-foot depth;

- Alternative 5: Vegetation and Root Mass Removal (15.3 acres) to a four-foot depth and additional Dredging (9.7 acres) to a 10-foot depth; and
- Alternative 6: No Project.

Alternatives 1 through 6 are summarized in Table ES-1 below. All the action alternatives (Alternatives 1 through 5) would require heavy equipment in the slough for vegetation and root mass removal and/or dredging, staging areas around the Project area, and trucking of the removed vegetation and/or sediment to local landfills or other disposal sites.

All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by Bay Conservation and Development Commission (BCDC), California State Lands Commission (CSLC), the District, or South Bay Yacht Club (SBYC) by the time of commencement of construction of this Project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Using a 2005 aerial photo of Alviso Slough, and applying visual simulation techniques, Figures ES-1 through ES-5 provide "before" and "after" views of the slough for each of the five action alternatives. Each figure includes detailed descriptions of the anticipated changes to the slough for the action alternative.

PERMITS AND APPROVALS

In addition to a District Board certified Final EIR, other approvals will be required to carry out any of the proposed actions being evaluated in this Final EIR. The list of major permits and consultations required for this Project are identified below.

Federal

- U.S. Army Corps of Engineers (USACE): Clean Water Act Section 404 - Individual Permit for dredging and activities within Waters of the United States[4];
- U.S. Fish and Wildlife Service (USFWS): Endangered Species Act Section 7 Consultation;
- National Marine Fisheries Service (NMFS): Consultation under the Endangered Species Act, Section 7, and Magnuson-Stevens Fishery Conservation and Management Act; and
- Possible EPA clearance (Alviso area CERCLA National Priorities List [NPL][5] status).

---

[4] USACE may be required to prepare an Environmental Assessment (EA) for compliance with the National Environmental Policy Act (NEPA). At their discretion, they may also prepare an Environmental Impact Statement (EIS), which requires more rigorous analysis of impacts. The USACE has sole discretion to prepare and approve their EA or EIS, and issuance of the 404 Permit would be reliant on completion of their NEPA process. The USACE consults with other Federal and State agencies before issuing or denying a permit, and an Individual Permit application is reviewed by the public. The U.S. Environmental Protection Agency (EPA) has oversight and enforcement authority over the USACE under the Clean Water Act, and can veto a permit issued by the USACE. The District could not construct the project until this Federal process would be completed.

[5] The NPL is the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation. From this web site, you can locate NPL sites, check their cleanup progress, and get information on new and proposed NPL sites.

Table ES-1 Summary Description of Alternatives

Project Elements	Alt. 1 Vegetation and Root Mass Removal (2.6 acres)	Alt. 2 Vegetation and Root Mass Removal (7.0 acres)	Alt. 3 Vegetation and Root Mass Removal and Dredge to 8-foot Depth (3.7 acres)	Alt. 4 Vegetation and Root Mass Removal and Dredge to 16-foot Depth (6.2 acres)	Alt. 5 Vegetation/ Root Mass Removal (15.3 acres) and Dredge to 10-foot Depth (9.7 acres)	Alt. 6 No Project[3]
Vegetation removed, c.y.	8,320	22,400	11,840	19,840	80,000	0
Sediment Removed (wet), c.y.	0	0	48,000	160,000	157,000	0
Length of slough affected by project work (feet)	1,400	3,400	2,300	2,200	3,300	0
Current average width of slough between Gold Street and County Marina (feet)[1]	50	50	50	50	50	50
Resultant average width of slough between Gold Street and County Marina (feet)[2]	80[3]	130	100	110	160	50[3]

Notes:

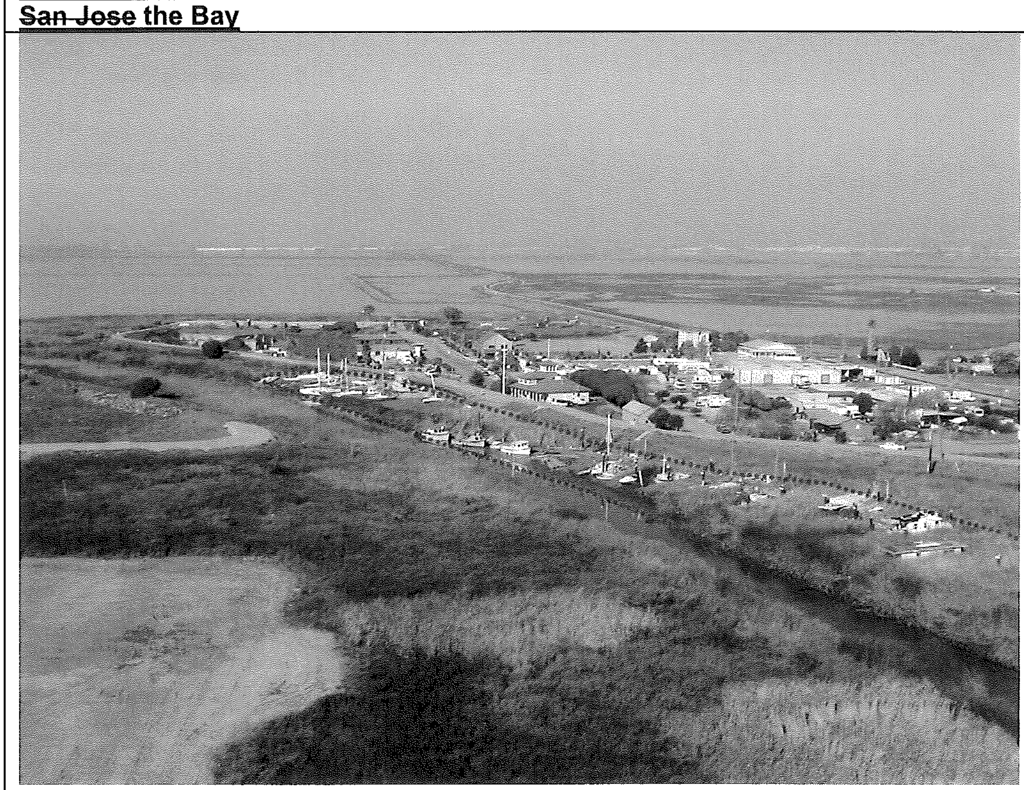
[1] Average width of slough before and after implementation of alternatives was determined based on approximately 10 equi-distant transects between Gold Street and the County Marina. The current average width of open water between Gold Street and County Marina was field measured on February 1, 2007.

[2] The resultant width of the slough after construction does not imply adequate depth for all boats at all tides. The widths do not include changes associated with the SBSP Phase 1 actions (see footnote 3)

[3] The Alternative 1 and No Project values of 80 and 50, respectively, do not consider the SBSP Phase 1 actions. The SBSP Phase 1 notch at Pond A8 is predicted to increase the average width of slough between Gold Street and County Marina by 50 to 90 feet, or to an estimated slough width of 100-140 feet, and resultant average width of 120 feet. Such action could potentially increase the resultant widths of Alternatives 1 and 6 as shown in the table. The other alternatives are predicted to attain a channel width as shown in table with or without the SBSP Phase 1 action.

Figure ES-1 Alternative 1 Photo Simulation

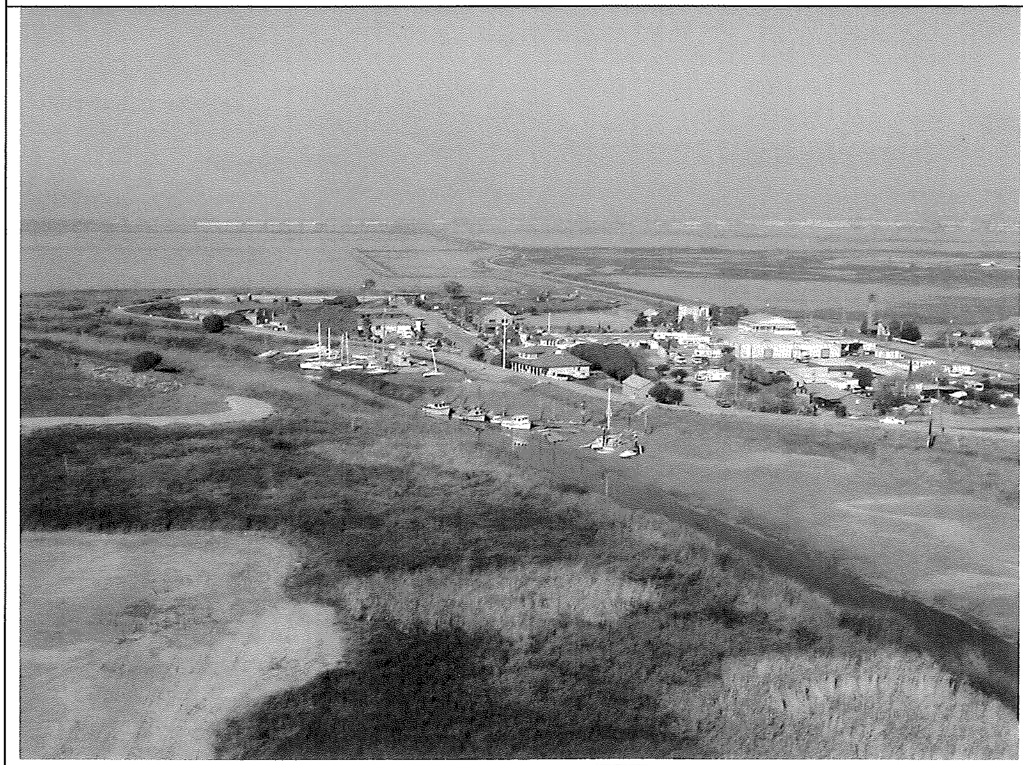
Photo Date/Time: February 3, 2005 at approx. 4p.m. (low tide conditions)
Description: View of Alviso Slough and SBYC, looking ~~up~~downstream towards ~~San Jose~~ the Bay



EXISTING CONDITIONS

Outline indicates proposed construction area.

~~Proposed location for pilot channel from SBSP Phase 1 Notch added for reference.~~



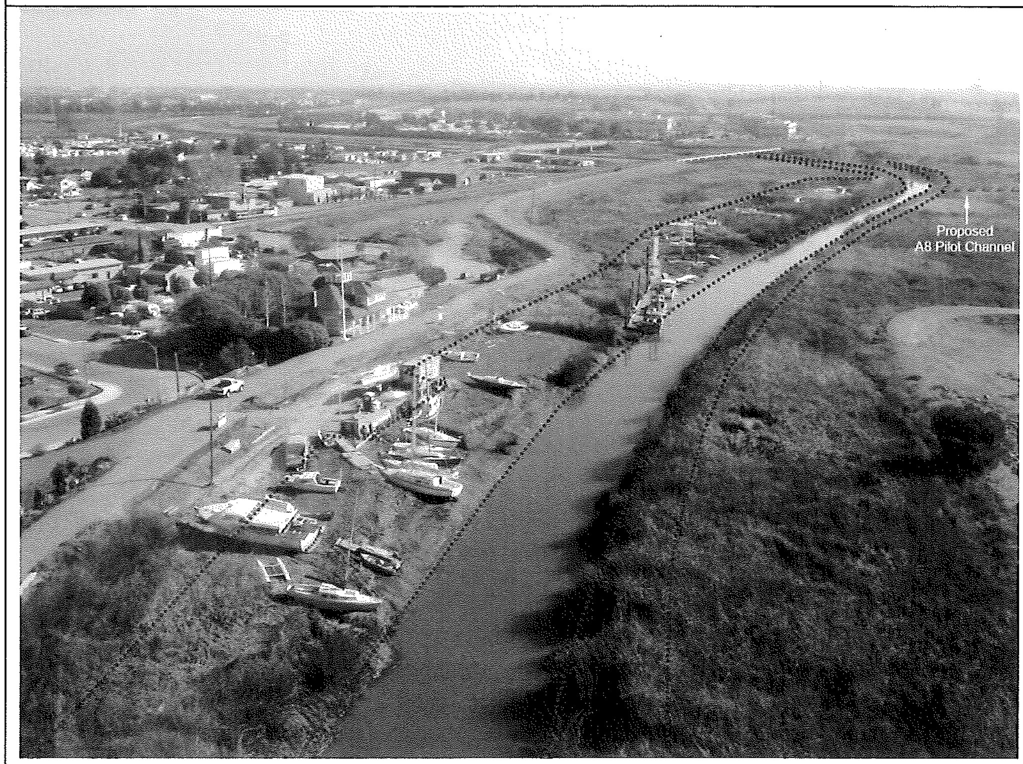
ALTERNATIVE 1

Results after 2.6 acres vegetation and root mass removal to 4-foot depth.

Visual simulation at low tide conditions. At low tide, mudflats would appear wherever vegetation and root mass are removed.

Figure ES-2 Alternative 2 Photo Simulation

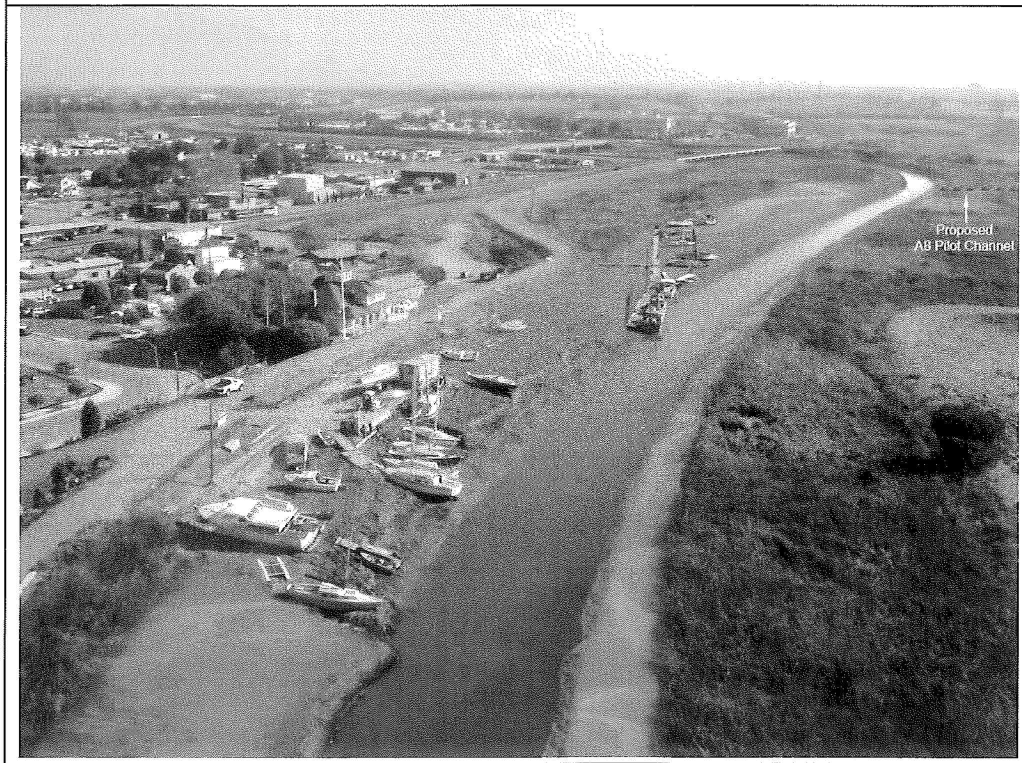
Photo Date/Time: February 3, 2005 at approx. 4p.m. (low tide conditions)
Description: View of Alviso Slough and SBYC, looking upstream towards San Jose



EXISTING CONDITIONS

Outline indicates proposed construction area.

Proposed location for pilot channel from SBSP Phase 1 Notch added for reference.



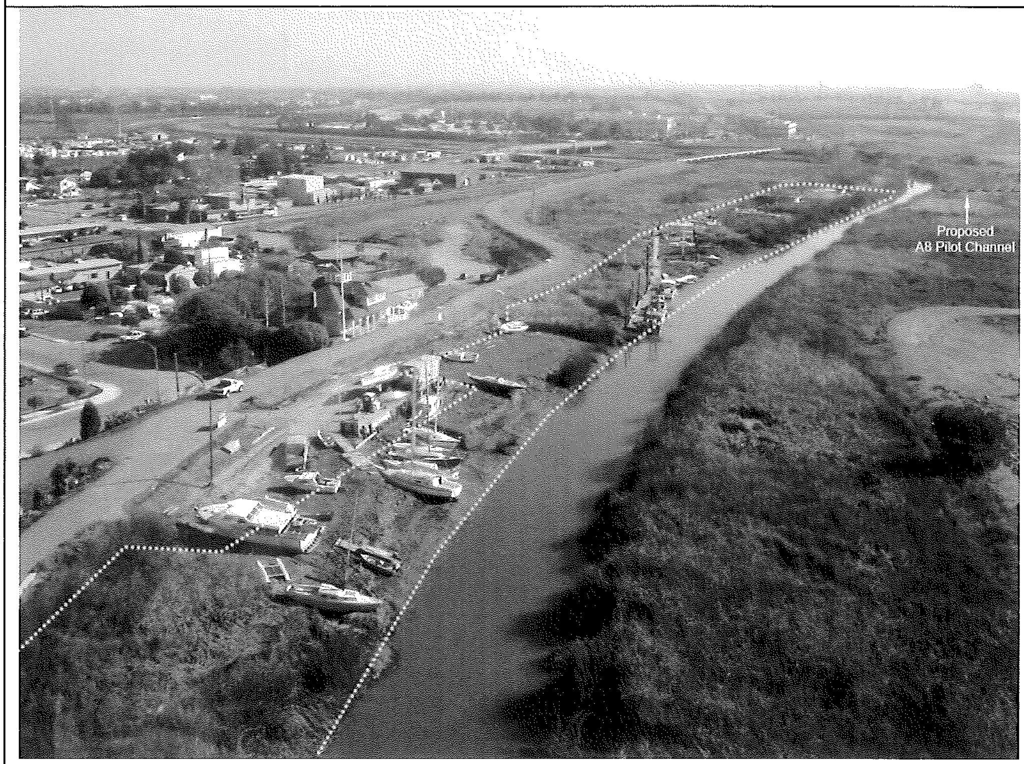
ALTERNATIVE 2

Results after seven acres of vegetation and root mass removal to 4-foot depth.

Visual simulation at low tide conditions. At low tide, mudflats would appear wherever vegetation and root mass are removed.

Figure ES-3 Alternative 3 Photo Simulation

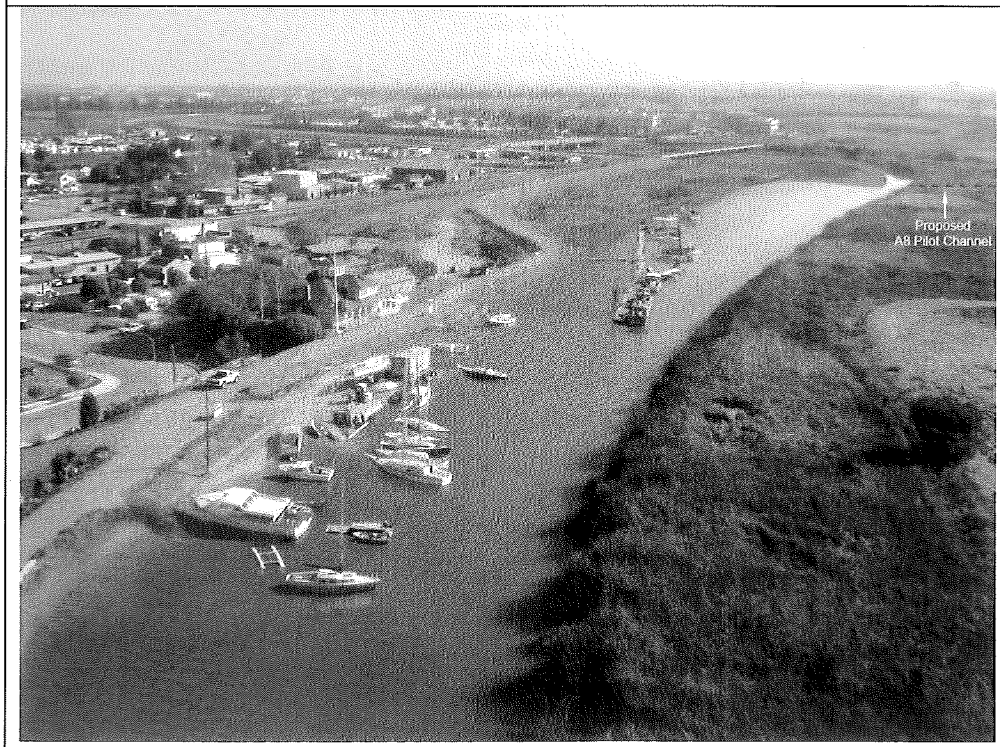
Photo Date/Time: February 3, 2005 at approx. 4p.m. (low tide conditions)
Description: View of Alviso Slough and SBYC, looking upstream towards San Jose



EXISTING CONDITIONS

Outline indicates proposed construction area.

Proposed location for pilot channel from SBSP Phase 1 Notch added for reference.



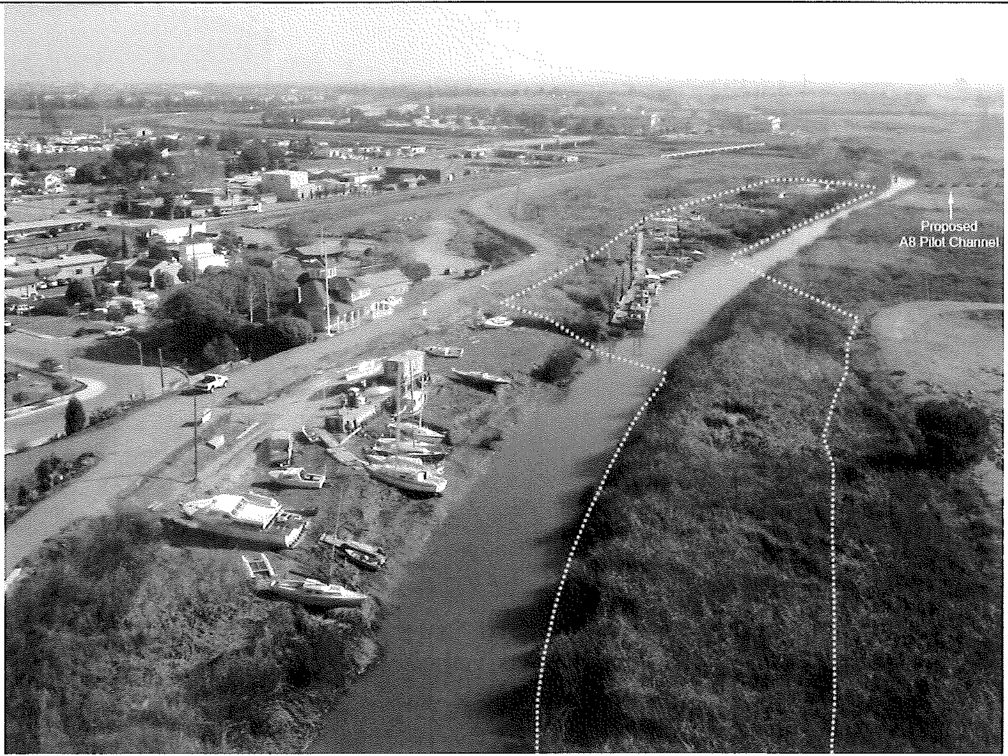
ALTERNATIVE 3

Results after 3.7 acres of vegetation and root mass removal and dredging to 8-foot depth.

Visual simulation at low tide conditions. This alternative would allow for two-way boat traffic at all times.

Figure ES-4 Alternative 4 Photo Simulation

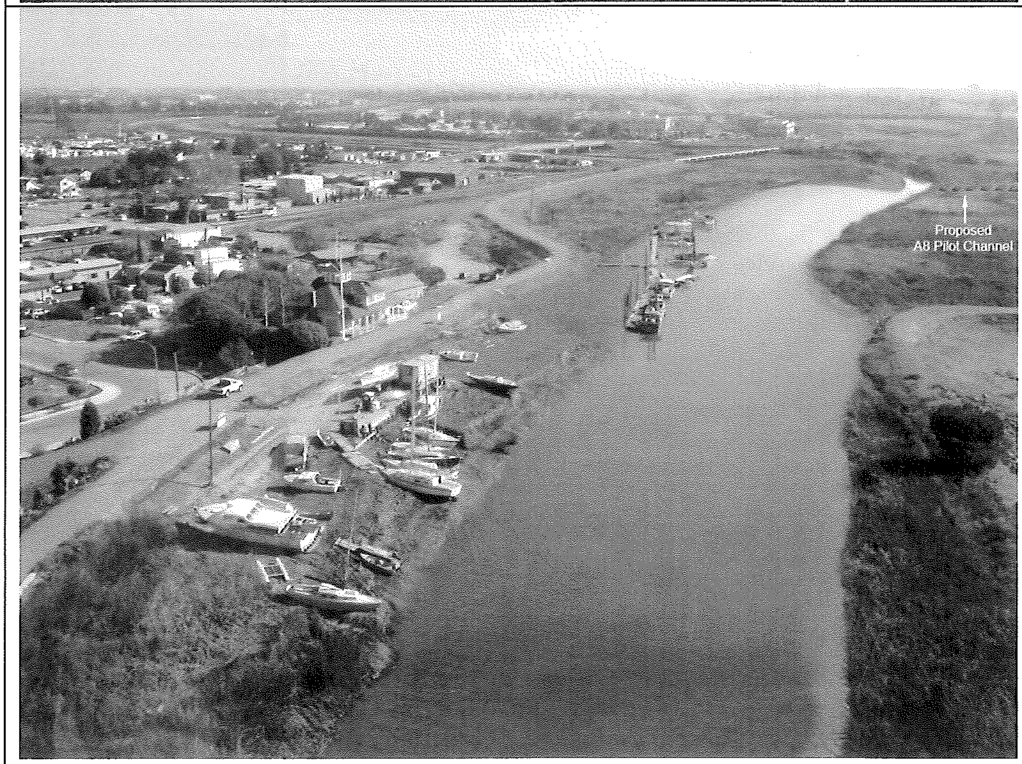
Photo Date/Time: **February 3, 2005 at approx. 4p.m. (low tide conditions)**
Description: **View of Alviso Slough and SBYC, looking upstream towards San Jose**



EXISTING CONDITIONS

Outline indicates proposed construction area.

Proposed location for pilot channel from SBSP Phase 1 Notch added for reference.



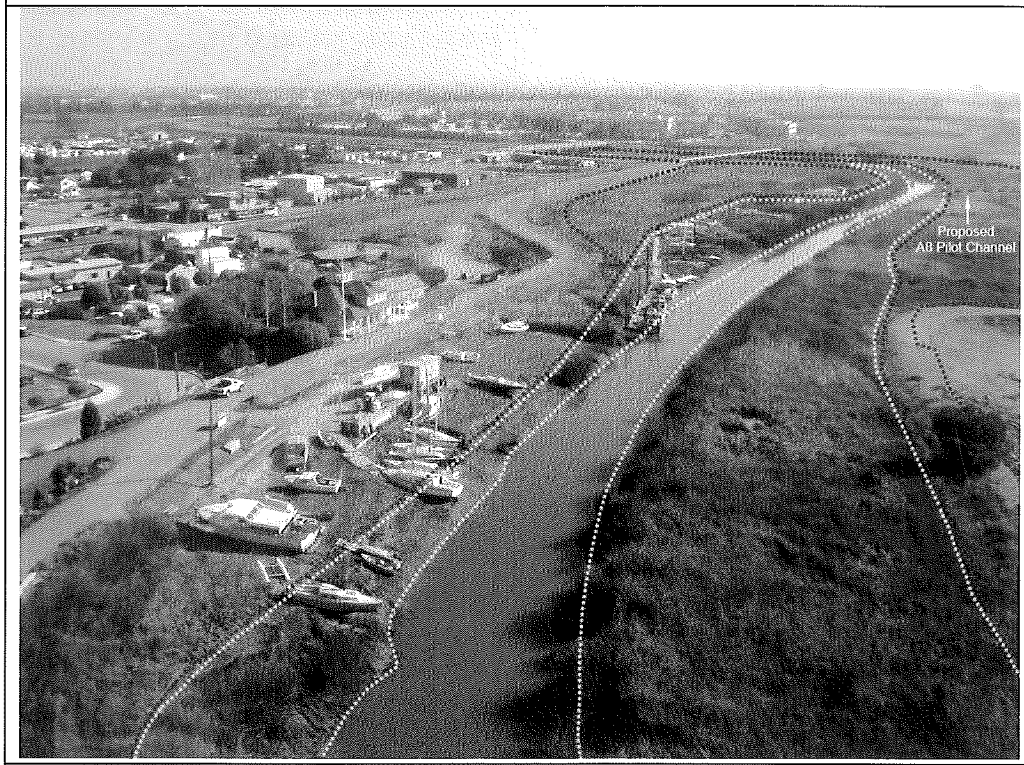
ALTERNATIVE 4

Results after 6.2 acres of vegetation and root mass removal and dredging to 16-foot depth.

Visual simulation at low tide conditions. As with Alternative 3, this alternative would also allow for two-way boat traffic at all times.

Figure ES-5 Alternative 5 Photo Simulation

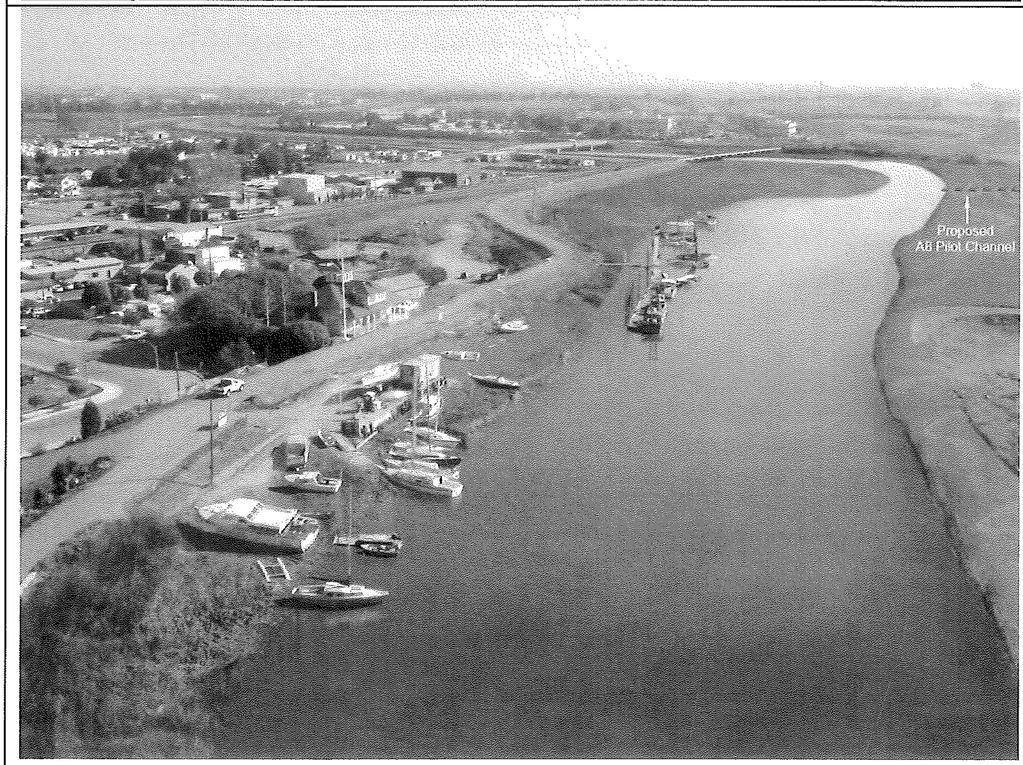
Photo Date/Time: **February 3, 2005 at approx. 4p.m. (low tide conditions)**
Description: **View of Alviso Slough and SBYC, looking upstream towards San Jose**



EXISTING CONDITIONS

Outline indicates proposed construction area (red is vegetation removal only; yellow is dredging).

Proposed location for pilot channel from SBSP Phase 1 Notch added for reference.



ALTERNATIVE 5

Results after 15.3 acres of vegetation and root mass removal to 4-foot depth, and an additional 9.7 acres of dredging to 10-foot depth.

Visual simulation at low tide conditions. At low tide, mudflats would appear wherever vegetation and root mass are removed without dredging. This alternative replicates early 1980's slough conditions.

State

- Regional Water Quality Control Board (RWQCB): Clean Water Act, Section 401 - Water Quality Certification and/or Porter-Cologne Water Quality Control Act, Waste Discharge Requirement;
- California Department of Fish and Game (CDFG): California Endangered Species Act - Consultation for special status species, and California Wetlands Conservation Policy;
- Bay Conservation and Development Commission (BCDC): Administrative or Major Permit for dredging activities under the Federal Coastal Zone Management Act and State McAteer-Petris Act, California Coastal Act, and San Francisco Bay Plan;
- Office of Historic Preservation: National Historic Preservation Act (NHPA) - Section 106 Review;
- California State Lands Commission: Consultation for California Environmental Quality Act (CEQA) and leased lands; and
- California State Department of Toxic Substances Control.

- California Department of Transportation (DOT): Transportation and Encroachment Permits.

Local

- City of San Jose Haul Route Permit; and
- City of San Jose Local Enforcement Agency (Hazardous Materials).

PUBLIC OUTREACH

Scoping

The District submitted the Notice of Preparation (NOP) of this ~~Draft~~ EIR to the California Office of Planning and Research on August 11, 2007 to solicit comments from public agencies on issues germane to that agency that should be considered in the ~~Draft~~ EIR. Public comments were received by mail and e-mail during the 45-day public scoping period, August 14 to September 14, 2007. As part of the scoping process, a public scoping meeting was held on August 30, 2007 in Alviso to solicit comments on environmental issues to be addressed in the EIR. All of the issues raised in the NOP comment letters have been addressed in the ~~Draft~~ Final EIR.

Public Hearing on Draft EIR

~~This~~ The Draft EIR ~~will be~~ was circulated for public review for 45 days; during ~~this~~ that time, a public hearing ~~will be~~ was held to solicit comments on the Draft EIR. Section 3.2 of the Draft EIR was revised and re-circulated for public review for 45 days, between June 16 and July 30, 2009.

AREAS OF CONTROVERSY

Section 15123 of the CEQA Guidelines requires that an EIR identify areas of controversy. The following is a brief summary of the areas of known controversy based on input from the public.

- Consideration that the proposed SBSP actions may be a feasible alternative to this Project in accordance with Section 404 b(1) guidelines to the Clean Water Act;

- Justification regarding the purpose and need for certain alternatives considering Federal, State, and Local laws, regulations, and policies protecting wetland habitats;
- Climate Change and Global Warming; and
- Environmental and social injustice in Alviso.

ISSUES TO BE RESOLVED

Section 15123 of the CEQA Guidelines requires that an EIR identify issues to be resolved. A list of these issues is provided below:

- Coordination with South Bay Salt Ponds Restoration Project to increase tidal prism through Alviso Slough via the Phase 1 Action at Pond A8 to meet the Project objectives and/or reduce impacts from ongoing maintenance;
- Identification of acceptable mitigation sites and impact evaluation at potential mitigation sites;
- Acquisition of regulatory permits;
- The ability for beneficial re-use of the dredged sediments; and
- Selection of the Preferred Alternative.

SUMMARY OF IMPACTS AND MITIGATION MEASURES

Table ES-2, following the Executive Summary Section, lists each environmental impact identified for the proposed alternatives, along with the significance of each impact. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (less than significant and does not require mitigation), or Class IV (beneficial). For easy reference, Class I impacts are identified in **bold**.

As shown in Table ES-2, most of the impacts that would result from the Project alternatives would be Class III or Class II. Class II impacts would be mitigated to less than significant levels based on the implementation of proposed mitigation measures identified in this EIR. Seven ~~Four~~ impacts under the action alternatives would remain potentially significant and unavoidable, as no mitigation measures are currently available to reduce these impacts to levels below the established thresholds of significance. These Class I significant impacts are:

1. Impact WQ-3: Potential to increase net methylmercury production and bioaccumulation in the food web (Alternatives 1 – 5).
2. Impact AQBIO-3: Construction-related release and exposure of legacy contaminants in sediments (Alternatives 1 – 5).
3. Impact AQBIO-4: Construction-related habitat disturbance (Alternatives 2 – 5).
4. Impact TERRBIO-15: Impacts to bird reproduction as a result of increased mercury methylation and bioaccumulation (Alternatives 1 – 5).

~~Impact AQ-1: Project-generated, short-term construction-related criteria air pollutant and precursor emissions – (ii) Construction-generated NO_x emissions (Alternatives 1 – 5).~~

5. Impact NOI-1: ~~On-Site, Off-Road, Heavy-Duty Equipment Noise Levels – (ii)~~ Construction: pile driving for pier installation (Alternatives 1 – 5).
6. Impact NOI-2: Offsite, On-road vehicle noise (Alternatives 1 – 5).

7. Impact NOI-3: Exposure to Groundborne Vibration (Alternatives 1 – 5).

Please see Chapter 3 of this EIR for further discussion of these impacts. The District Board~~BOD~~ would be required to adopt a statement of overriding considerations as part of the Final EIR certification process for these significant unavoidable impacts.

Impact AQBIO-4 would also make a considerable contribution to cumulative impacts. Refer to Chapter 4 for a more detailed discussion of cumulative impacts.

In addition to the mitigation measures proposed as part of this project, the District would implement relevant, standard best management practices (BMPs), including but not limited to BMPs from the District BMP Handbook (SCVWD 2006) and the Stream maintenance Program. BMPs are common-sense practices that are intended to protect sensitive environmental resources (e.g., biological resources, water quality, etc.). BMPS are not identified in Table ES-2 below, but are described in individual sections of Chapter 3 of this EIR.

Unless noted, impact classification and mitigation measures are the same whether or not the SBSP Restoration Project is implemented and successful.

STAFF RECOMMENDED ALTERNATIVE ~~– ENGINEER'S REPORT~~

Concurrent with this ~~Draft~~ Final EIR is the preparation of a ~~Draft~~ Final Engineer's Report. It is District ~~policy dictates~~ practice that an Engineer's Report ~~shall identify a single feasible~~ identifies a staff-recommended action for detailed design and cost evaluation.

~~This project's~~ The planning effort for this project ~~study~~ was initiated and carried out through a collaborative process agreed to by the District and members of the Alviso community. Evaluation of the action alternatives was performed by applying two categories of criteria: community-based criteria and technical criteria. Due to the collaborative approach for this project, the community-based criteria and the technical criteria were each given a 50 percent weight in the alternatives' evaluation process.

The community-based criteria address 1) to what extent an alternative meets the project objectives; and 2) the community's preference among the feasible alternatives. The technical criteria address project cost-effectiveness, project sustainability, and environmental impacts.

Each of the action alternatives was assigned a ranking of 1 to 5 for each criterion or sub-criterion, with 5 fully meeting a criterion, and 1 not meeting the criterion. Based on this approach, Alternative 5 achieved the highest score and was identified as the Staff-Recommended Alternative in the Draft EIR (May 2008). ~~and has been identified as the Staff-Recommended Alternative. Alternative 1, the least costly, most easily sustained in the longer-term, and having the least environmental impact of the action alternatives, ranked a close second.~~ Upon receipt and review of comments on the Draft EIR, and the volume of concerns expressed with regard to cost-effectiveness, project sustainability and environmental impacts, District staff has changed the Staff-Recommended Alternative to Alternative 3. Alternative 3 is less costly than Alternative 5 and has fewer potential environmental impacts due to the reduced area of vegetation and root mass removal (3.7 acres versus 15.3 acres), and a lesser depth of dredging (3.7 acres dredged to 8 feet versus 9.7 acres dredged to 10 feet).

The District Board will ultimately consider approval of a specific project based on public input, engineering and cost analyses contained in the ~~draft~~ Final Engineer's Report, and environmental aspects included in this Final ~~Draft~~ EIR.

ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA requires that each EIR identify the "environmentally superior alternative" among all of those considered. If the No Project Alternative is identified as environmentally superior, then the EIR also must identify the environmentally superior alternative among the other alternatives (CEQA Guidelines Section 15126 (e)(2). The goal of identifying the environmentally superior alternative is to assist decision makers in considering project approval. CEQA does not, however, require an agency to select the environmentally superior alternative.

The No Project Alternative (Alternative 6) would avoid all project related adverse impacts, but would also forego the desired benefits to Alviso Slough. Of the action alternatives (Alternatives 1 through 5), the District considers the CEQA Environmentally Superior Alternative to be Alternative 1. Alternative 1 limits the Project footprint to 2.6 acres in the area that would most benefit from the vegetation removal - the area around the SBYC docks. Removal of 2.6 acres of vegetation minimizes direct impacts to wetland vegetation, minimizes the need for extensive truck trips to the disposal facility, and minimizes the need for large staging/stockpiling areas for sediment drying. Most importantly, perhaps, is that the footprint of Alternative 1 is within the estimated two to five acres that would scour over the next 10 years as a result of a successful SBSP Restoration Project Phase 1 Action. This, in effect, would reduce, or could even eliminate the need for ongoing maintenance by the Alviso Slough Restoration Project in this area. Alternative 1 does not, however, meet all of the Project objectives.

KEY REVISIONS ~~ERRATA~~

Additional information was added or revised to the following impact discussions:

- HYD-4
- WQ-1
- WQ-2
- WQ-3
- WQ-4
- WQ-5
- AQBIO-3
- AQBIO-4
- AQBIO-5
- AQBIO-8
- TERRBIO-1
- TERRBIO-7
- TERRBIO-14
- TERRBIO-15
- HAZMAT-2
- AQ-1
- AQ-2
- AQ-3
- NOI-2
- LAND-1

- LAND-2
- REC-1
- TRANS-2
- TRANS-3

Revisions were made to the following mitigation measures:

- HYD-A
- HYD-E
- WQ-A
- WQ-B
- WQ-C
- REC-A
- TRANS-A
- TRANS-C

Additionally, a new impact CUM-1 and its corresponding Mitigation Measure CUM-A have been added to Chapter 4 Growth Inducement. A list of the Best Management Practices from the 2008 (revised version) have been added as Appendix II.

Table ES-2 Summary of Impacts

Impact	Impact Significance[1]	Mitigation Measures
Hydrology and Geomorphology		
Impact HYD-1: Increased fluvial flood risk (post construction).	Alts. 1-5: Class II	HYD-A* (HYD-F applies if SBSP is implemented and successful)
	Alt. 6: No Impact	--
Impact HYD-1: Increased fluvial flood risk (maintenance period).	Alts. 1-5: Class II	HYB-B HYD-C (HYD-F applies if SBSP is implemented and successful)
	Alt. 6: No Impact	--
Impact HYD-1: Increased fluvial flood risk (long term).	Alts. 1-5: Class II	HYB-B HYD-C (HYD-F applies if SBSP is implemented and successful)
	Alt. 6: No Impact	--
Impact HYD-2: Increased levee erosion along downstream channel banks.	Alts. 1-4: Class III	--
	Alt. 5: Class II	HYD-D (HYD-G applies if SBSP is implemented and successful)
	Alt. 6: No Impact	--
Impact HYD-3: Increased levee erosion within the Project area.	Alts. 1-5: Class II	HYD-E*
	Alt. 6: No Impact	--
Impact HYD-4: Increased coastal flood risk.*	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Water and Sediment Quality		
Impact WQ-1: Potential to cause localized low DO levels.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	—
Impact WQ-2: Potential to mobilize, transport, and deposit mercury-contaminated sediments.	Alts. 1-2: Class III	--
	Alts. 3-5: Class II~~V~~	WQ-A* WQ-B*
	Alt. 6: No Impact	—
Impact WQ-3: Potential to increase net methylmercury production and bioaccumulation in the food web.	[redacted]	WQ-C* TERRBIO-B

---

* = Indicates that an impact discussion or mitigation measure has been revised in the Final EIR.

[1] Class I (significant, cannot be mitigated to a level that is less than significant);
Class II (significant, can be mitigated to a level that is less than significant);
Class III (less than significant); or
Class IV (beneficial).

Impact	Impact Significance[1]	Mitigation Measures
	Alt. 6: No Impact	—

Table ES-2 Summary of Impacts (continued)

Impact	Impact Significance[1]	Mitigation Measures
Impact WQ-4: Potential to mobilize, transport, and deposit PCBs and organochlorine pesticides.	Alts. 1-2: Class III	~~WQ-A~~
	Alts. 3-5: Class II~~V~~	WQ-A* WQ-B*
	Alt. 6: No Impact	—
Impact WQ-5: Potential impacts to water quality as a result of increased illegal discharges and dumping.	Alts. 1-5: Class IV	--
	Alt. 6: No Impact	—
Impact WQ-6 Potential for surface water contamination of groundwater.	Alts. 1-5: No Impact	--
	Alt. 6: No Impact	—
Impact WQ-7 Impacts from removal of navigational hazards.	Alts. 1-5: Class IV	--
	Alt. 6: No Impact	—
Impact WQ-8 Impacts from drying and rehandling removed sediment and/or vegetation.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	—
Biological Resources - Aquatic		
Impact AQBIO-1: Construction-related increases in sediments and turbidity.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact AQBIO-2: Release and exposure of construction-related contaminants.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact AQBIO-3: Construction-related release and exposure of legacy contaminants in sediments.	[redacted]	WQ-A* WQ-B* WQ-C* TERRBIO-B
	Alt. 6: No Impact	--
Impact AQBIO-4: Construction-related habitat disturbance.*	Alt. 1: Class II	AQBIO-A AQBIO-B
	[redacted]	AQBIO-A AQBIO-B
	Alt. 6: No Impact	--
Impact AQBIO-5: Conversion of wetland / marsh aquatic habitat to open water habitat.*	Alts. 1-5: Class II	AQBIO-A TERRBIO-B*
	Alt. 6: No Impact	--
Impact AQBIO-6: Impacts related to Mitigation Measure	Alts. 1-5: Class III	--

---

* = Indicates that an impact discussion or mitigation measure has been revised in the Final EIR.

[1] Class I (significant, cannot be mitigated to a level that is less than significant);
Class II (significant, can be mitigated to a level that is less than significant);
Class III (less than significant); or
Class IV (beneficial).

Table ES-2 Summary of Impacts (continued)

Impact	Impact Significance[1]	Mitigation Measures
TERRBIO-B, wetland creation.	Alt. 6: No Impact	--
Impact AQBIO-7: Increased entrainment of fish species into Pond A8.	Alts. 1-5: Class II	HYD-A
	Alt. 6: No Impact	--
Impact AQBIO-8: Impacts related to boat use.*	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Biological Resources - Terrestrial		
Impact TERRBIO-1: Potential construction-related loss of, or disturbance to, special-status, marsh-associated wildlife.*	Alts. 1-5: Class II	TERRBIO-A TERRBIO-B*
	Alt. 6: No Impact	--
Impact TERRBIO-2: Potential disturbance to, or loss of, sensitive wildlife species due to maintenance activities.	Alts. 1-5: Class II	TERRBIO-A
	Alt. 6: No Impact	--
Impact TERRBIO-3: Potential construction-related loss of, or disturbance to pond-nesting recurvirostrids (e.g., American avocet, black-necked stilt).	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact TERRBIO-4: Potential construction-related loss of, or disturbance to pond-nesting Western snowy plovers.	Alts. 1-5: Class II	TERRBIO-C
	Alt. 6: No Impact	--
Impact TERRBIO-5: Potential impacts to piscivorous birds.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact TERRBIO-6: Potential impacts to foraging habitat for diving and dabbling ducks.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact TERRBIO-7: Potential impacts to special-status plant species.*	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact TERRBIO-8: Colonization by non-native perennial pepperweed (*Lepidium latifolium*).	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact TERRBIO-9: Impacts to tidal marsh habitat through removal of vegetation and dredging.	Alts. 1-5: Class II	TERRBIO-B*
	Alt. 6: No Impact	--
Impact TERRBIO-10: Impacts to jurisdictional wetlands.	Alts. 1-5: Class II	TERRBIO-B*
	Alt. 6: No Impact	--
Impact TERRBIO-11: Impacts related to Mitigation Measure TERRBIO-B, wetland creation.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact TERRBIO-12: Impacts related to the Mitigation Measure HYD-A and HYD-B, impacts to wetlands from hydrological mitigation measures.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact TERRBIO-13: Impacts related to stockpiling of materials.	Alts. 1-5: Class II	TERRBIO-A TERRBIO-C TERRBIO-D
	Alt. 6: No Impact	--
Impact TERRBIO-14: Impacts related to increased boat use.*	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--

---

* = Indicates that an impact discussion or mitigation measure has been revised in the Final EIR.

[1] Class I (significant, cannot be mitigated to a level that is less than significant);
Class II (significant, can be mitigated to a level that is less than significant);
Class III (less than significant); or
Class IV (beneficial).

Table ES-2 Summary of Impacts (continued)

Impact	Impact Significance[1]	Mitigation Measures
Impact CUM-1 (related to TERRBIO-14)	Alts. 1-5: Class II	CUM-A
Impact TERRBIO-15: Impacts to bird reproduction as a result of increased mercury methylation and bioaccumulation.	[redacted]	WQ-C* TERRBIO-B
	Alt. 6: No Impact	--
Public Health and Vector Management		
Impact VECTOR-1: Increase in Breeding Habitat.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact VECTOR-2: Increase in Breeding Habitat from Wetland Mitigation.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Geology and Soils		
Impact GEOL-1: Accelerated erosion due to construction.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact GEOL-2: Excavation or dredging during construction could cause slope instability.	Alts. 1, 2: Class III	--
	Alts. 3, 4: Class II	GEOL-A GEOL-B GEOL-C
	Alt. 5: Class II	GEOL-A GEOL-B GEOL-C GEOL-D
	Alt. 6: No Impact	--
Impact GEOL-3: Project or nearby structures could be damaged by seismically induced groundshaking and/or ground failure.	Alts. 1, 2: Class III	--
	Alts 3, 4, 5: Class II	GEOL-A GEOL-B GEOL-C
	Alt. 6: No Impact	--
Hazards and Hazardous Materials		
Impact HAZMAT-1: Inadvertent release of hazardous materials during construction activities.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact HAZMAT-2: Potential to mobilize, transport, and deposit asbestos, hydrocarbon-contaminated sediments, and/or mercury.	Alts. 1-5: Class II	HAZMAT-A HAZMAT-B WQ-A* WQ-B*
	Alt. 6: No Impact	--
Air Quality		

---

* = Indicates that an impact discussion or mitigation measure has been revised in the Final EIR.

[1] Class I (significant, cannot be mitigated to a level that is less than significant);
Class II (significant, can be mitigated to a level that is less than significant);
Class III (less than significant); or
Class IV (beneficial).

Table ES-2 Summary of Impacts (continued)

Impact	Impact Significance[1]	Mitigation Measures
Impact AQ-1: Project-generated, short-term construction-related criteria air pollutant and precursor emissions: (i) Construction-generated fugitive PM10 dust emissions (ii) Construction-generated NOx emissions.	(i) Alts. 1 -5: Class II (ii) Alts. 1-5: Class III	-- ~~AQ-A~~ --
	Alt 6: No Impact	--
Impact AQ-2: Potential exposure of sensitive receptors to TAC emissions.	Alts. 1-5: Class II	AQ-A AQ-B
	Alt. 6: No Impact	--
Impact AQ-3: Potential introduction of unpleasant odor from vegetation removal.	Alts. 1-5: Class III	--
	Alt 6: No Impact	--
Noise		
Impact NOI-1: On-Site, Off-Road, Heavy-Duty Equipment Noise Levels: ~~(i) Construction: vegetation removal, dredging, and hauling.~~ (i~~i~~) Construction: pile driving for pier installation.	(i) Alts. 1-5: Class II [redacted]	NOI-A NOI-B
	Alt. 6: No Impact	--
Impact NOI-2: Off-Site, On-Road Vehicle Noise.	[redacted]	NOI-C
	Alt. 6: No Impact	--
Impact NOI-3: Exposure to Groundborne Vibration.	[redacted]	NOI-D
	Alt. 6: No Impact	--
Land Use and Planning		
Impact LAND-1: Conflict with plan, policy or regulation of agencies with jurisdiction over the Project.*	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact LAND-2: Short-term construction related land use conflict.*	Alts. 1-5: Class II	LU-A
	Alt. 6: No Impact	--
Recreation		
Impact REC-1: Loss of recreational opportunities or access, or degradation in recreational experiences due to construction. *	Alts. 1-5: Class II	REC-A*
	Alt. 6: No Impact	--
Impact REC-2: Changes to long-term recreational opportunities and experiences.	Alts. 1-5: Class IV	--
	Alt. 6: No Impact	--
Cultural and Historic Resources		
Impact CUL-1: Impacts to Known Cultural Resources.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact CUL-2: Impacts to As-Yet Unknown Cultural Resources, including human remains.	Alts. 1-5: Class II	CUL-A CUL-B

---

* = Indicates that an impact discussion or mitigation measure has been revised in the Final EIR.

[1] Class I (significant, cannot be mitigated to a level that is less than significant);
Class II (significant, can be mitigated to a level that is less than significant);
Class III (less than significant); or
Class IV (beneficial).

Table ES-2 Summary of Impacts (continued)

Impact	Impact Significance[1]	Mitigation Measures
	Alt. 6: No Impact	--
Transportation and Traffic		
Impact TRANS-1: Short-term degradation of traffic levels on a roadway or at an intersection due to haul truck traffic.	Alts. 1-5: Class II	TRANS-A*
	Alt. 6: No Impact	--
Impact TRANS-2: Addition of haul truck traffic on sections of the San Francisco Bay Trail.	Alts. 1-5: Class III	TRANS-B
	Alt. 6: No Impact	--
Impact TRANS-3: Increase in wear and tear on the designated haul routes during construction.*	Alts. 1-5: Class II	TRANS-C*
	Alt. 6: No Impact	--
Impact TRANS-4: Roadway safety hazards associated with haul truck traffic exiting/entering staging areas.	Alts. 1-5: Class II	TRANS-D
	Alt. 6: No Impact	--
Public Services		
Impact SERV-1: Increased demand for fire and police protection services.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Utilities		
Impact UTIL-1: Changes in water level, tidal flow and sedimentation near pumping facilities or outfalls.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact UTIL-2: Short-term increase in solid waste disposal from removal of vegetation, sediment, and navigational hazards.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Aesthetics		
Impact AES-1: Effects on scenic vistas.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact AES-2: Effects on the visual character of the Project area.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Social and Economic Effects, including Environmental Justice		
Impact SOCIOEC-1: Displace, relocate, or increase area businesses associated with the expected increase in recreational users.	Alts. 1-2: No Impact	--
	Alts. 3-5: Class IV	--
	Alt. 6: No Impact	--
Impact SOCIOEC-2: Change lifestyles and social interactions.	Alts. 1-5: Class IV	--
	Alt. 6: No Impact	--
Impact SOCIOEC-3: Effects disproportionately placed on minority and low-income communities or effects on the ethnic or racial composition in a community.	Alts. 1-6: No Impact	--
Impact SOCIOEC-4: Change local employment opportunities and community tax base.	Alts. 1-6: No Impact	--

---

* = Indicates that an impact discussion or mitigation measure has been revised in the Final EIR.

[1] Class I (significant, cannot be mitigated to a level that is less than significant);
Class II (significant, can be mitigated to a level that is less than significant);
Class III (less than significant); or
Class IV (beneficial).

Table ES-2 Summary of Impacts (continued)

Impact	Impact Significance[1]	Mitigation Measures
Growth Inducement and Cumulative Analysis*		
Impact CUM-1: Cumulative impacts related to increased boat use.*	Alts. 1-5: Class II*	CUM-A*
	Alt. 6: No Impact	--

---

* = Indicates that an impact discussion or mitigation measure has been revised in the Final EIR.

[1] Class I (significant, cannot be mitigated to a level that is less than significant);
Class II (significant, can be mitigated to a level that is less than significant);
Class III (less than significant); or
Class IV (beneficial).

This page intentionally left blank

1. Introduction

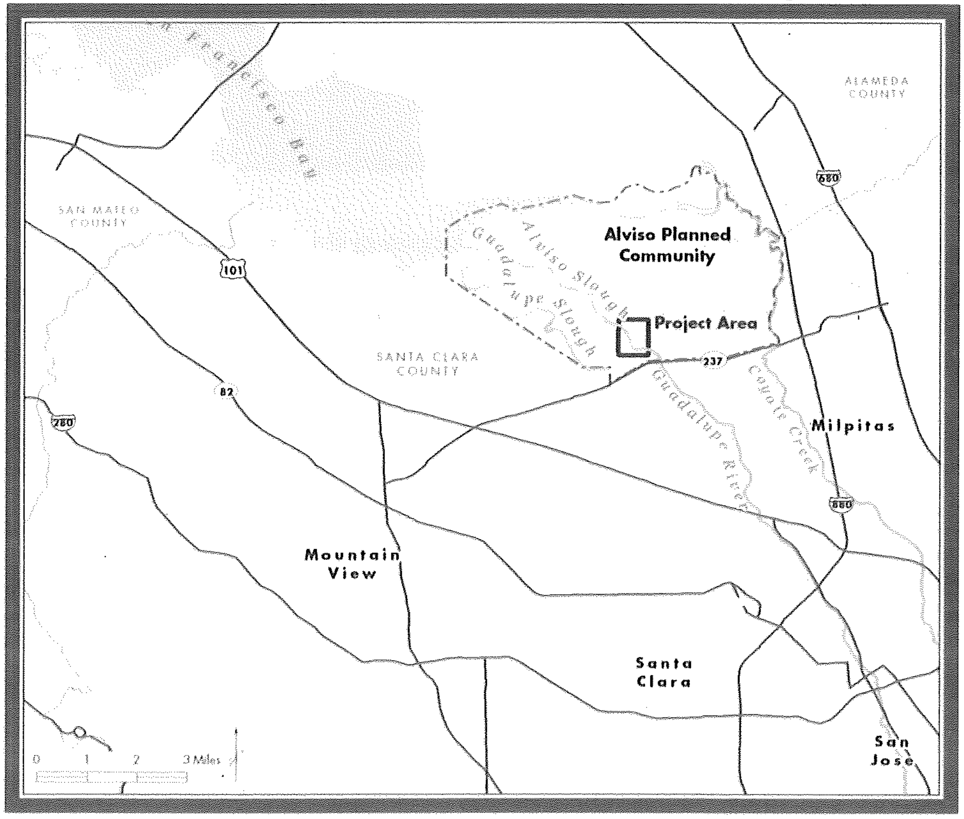
1.1 ALVISO SLOUGH OVERVIEW

Alviso is an historic town at the edge of San Francisco Bay, now incorporated into the City of San Jose, California. The Alviso Slough Restoration Project (Project) area is situated on the banks of Alviso Slough between the Gold Street Bridge and the Alviso County Marina in the lowest reach of the Guadalupe River. The slough continues several miles downstream before it enters South San Francisco Bay (see Figures 1-1 and 1-2). Historically, the reach was used for navigation, recreational boating, and public access. The Alviso Marina County Park and former salt ponds, which are now part of the Don Edwards San Francisco Bay National Wildlife Refuge, surround the Alviso area.

The Alviso Slough channel has gradually narrowed due to sediment accumulation and vegetation encroachment over the last 25 years. These conditions are a consequence of modification of the South Bay marshlands and drainage channels for agricultural and salt-making (evaporator ponds) purposes and groundwater over-pumping that largely occurred prior to the 1950's. More recently, urban development and flood management in the upper Guadalupe River watershed have contributed to changes in the slough area.

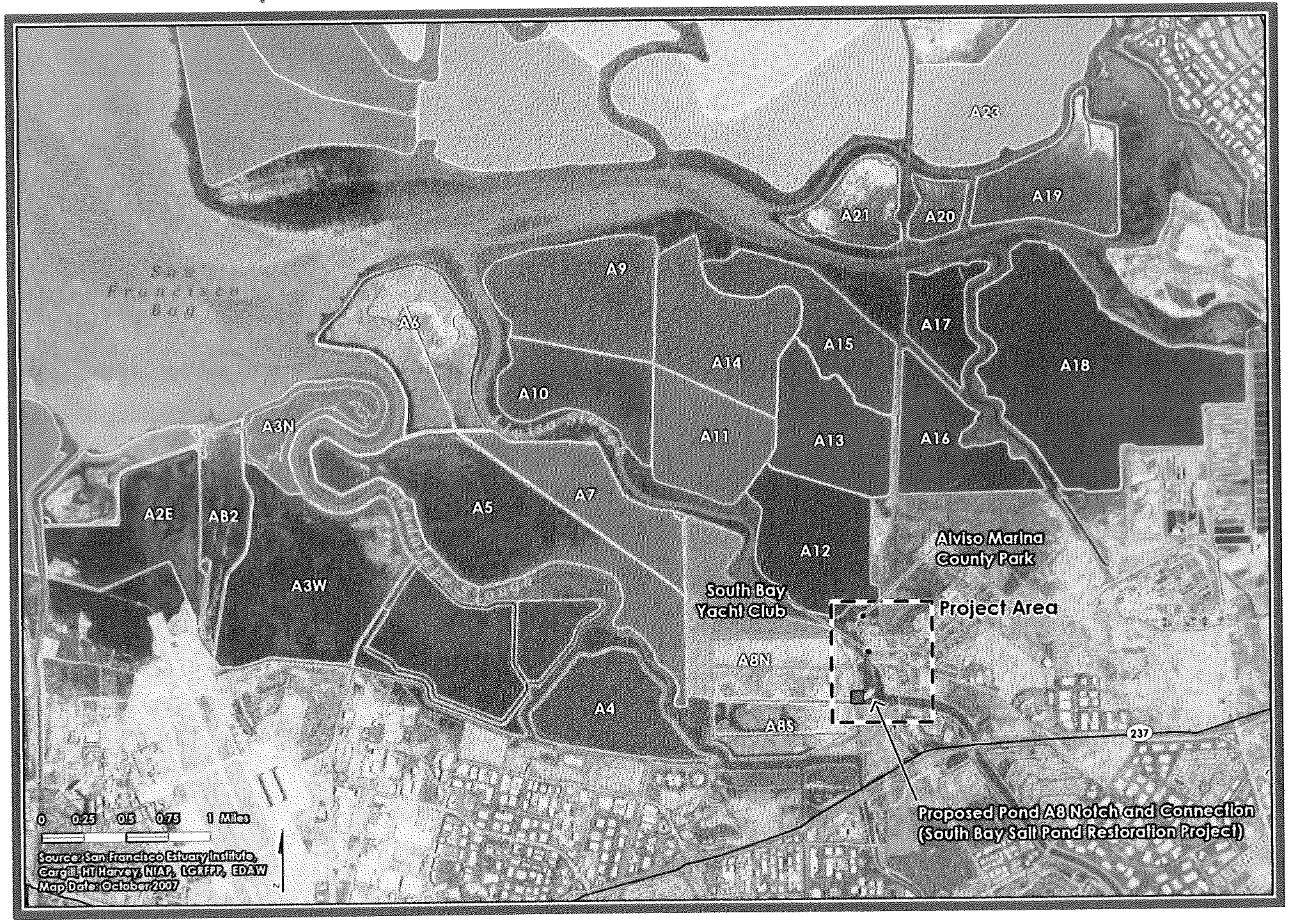
Alviso Slough Restoration Project

Figure 1-1
Regional Location



Alviso Slough Restoration Project

Figure 1-2
Project Area Location



Source: San Francisco Estuary Institute, Cargill, HT Harvey, NIAP, LGRFPP, EDAW
Map Date: October 2007

Aerial photographs spanning the years 1939 to 2004 show a reduction in channel width (see Figure 1-3). Although these aerial photographs show an area just downstream of the Project area, the same channel narrowing has occurred in the Project area. Residents of Alviso confirm that the rate of channel narrowing and vegetation increase was more rapid after the winter storms of 1982-1983. Resident accounts and photographs of boating and water skiing in the Alviso Slough in the late 1970s are not uncommon (Rivera 2006).

1.2 PURPOSE AND NEED FOR ACTION

1.2.1 Santa Clara Valley Water District Act and Watershed Stewardship

The Santa Clara Valley Water District (District) is a public agency organized under state special district provisions and the Santa Clara Valley Water District Act.[1] The Act establishes a Board of Directors to set policies, determine revenues and expenditures, and monitor the achievement of its purposes. In connection with carrying out water and flood management the District may undertake

---

[1] District Act, Chapter 1405 of the Statutes of 1951, as most recently amended by Chapter 279 of the Statutes of 2006)

Alviso Slough Restoration Project

Figure 1-3:
Alviso Slough Channel Width, 1939 - 2004

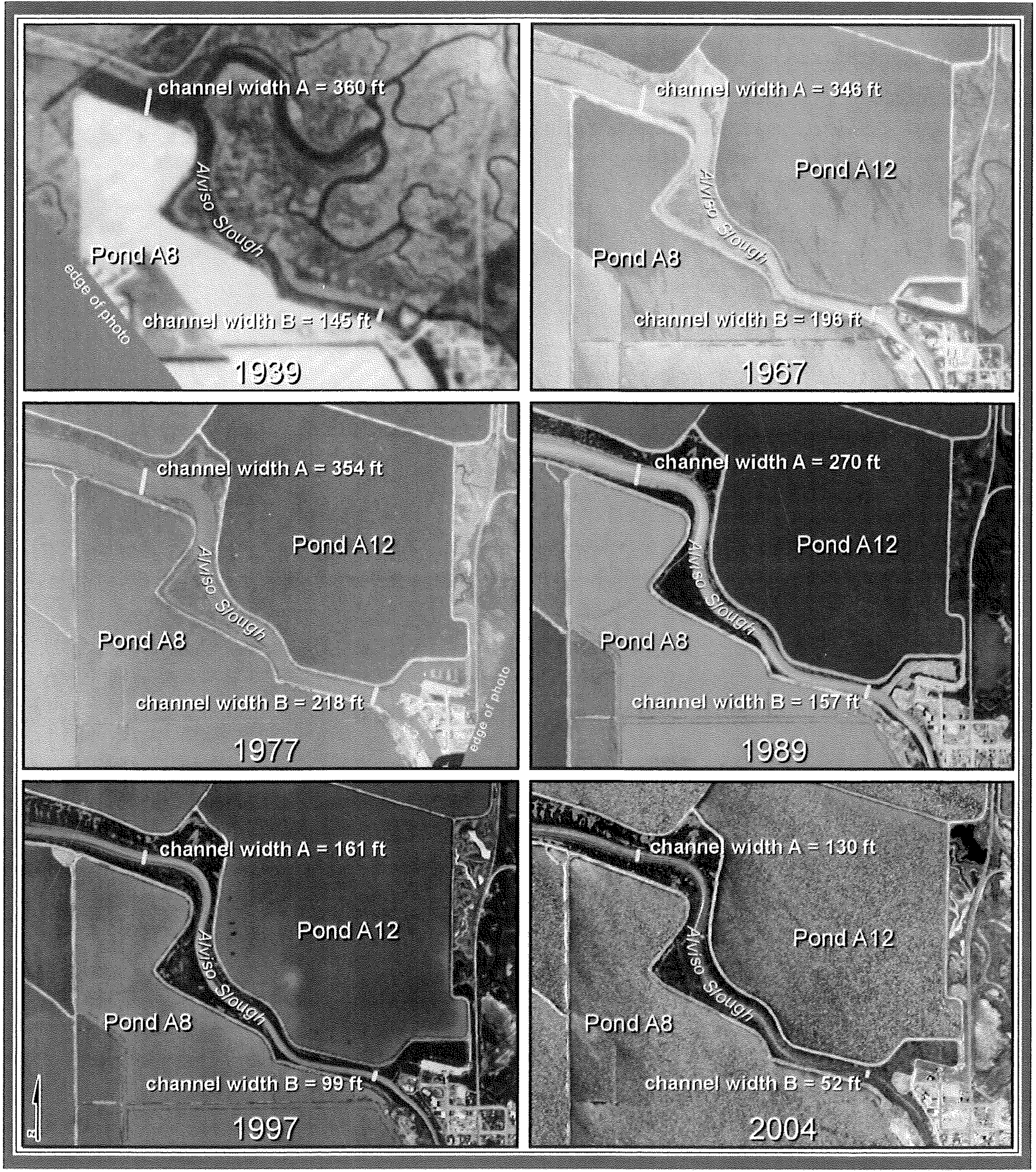


Photo courtesy: H.T. Harvey & Associates activities that enhance, protect, and restore streams, riparian corridors, and natural resources.[2] ~~and acquire, construct, maintain, operate and install landscaping or recreational facilities in connection with any dam, reservoir, or other works owned or controlled by the District.~~[3]

To this end, the Board of Directors (BOD) had adopted policies that emphasize the District's commitment to a "...enhanced quality of living in Santa Clara County through watershed stewardship and comprehensive management of water resources in a practical, cost-effective and environmentally - sensitive manner."[4] Specifically, the Board has declared its commitments to fulfill this mission through its Ends policies:

> 3.2 Environmental Enhancements are implemented to improve watersheds, streams, and the natural resources therein.
>
> 3.3 There are additional trails, parks, and open space along creeks and in the watersheds when reasonable and appropriate.

1.2.2 District Flood Management Projects Drive Enhancements for the Community

The Lower Guadalupe River has been the focus of a series of District flood protection projects. Levees were constructed in the 1980s, and raised in 1995 to improve flood protection for Alviso. Between 2002 and 2004, the District constructed the current Lower Guadalupe River Flood Protection Project (LGRP), which provides one-percent flood protection from overbank flooding from I-280 in San Jose to the Alviso Marina County Park. The project includes a combination of floodwalls, levees, and channel improvements from Coleman Avenue to Alviso. Downstream of Gold Street in Alviso, flood flows in excess of the channel capacity flow over the diversion weir into Pond A8.

Members of the local community expressed concern that these flood improvements benefited the San Jose community upstream while failing to address the needs, beneficial uses, and the natural resources of the Alviso area. Under the aegis of the Board Ends Policy 3.2 (above), community members requested that the District investigate possible approaches to restore historic uses of the Alviso Slough areas, particularly those lost due to the loss of the channel width and depth.

In 2004, the District BOD directed District staff to develop a project to remove seven acres of vegetation and root mass from Alviso Slough between the Gold Street Bridge and the Alviso Marina County Park and, in the following year, to implement a long-term project to re-establish the saltwater connection to the Lower Guadalupe River. A Project Plan for the Alviso Slough Restoration Project was subsequently prepared in collaboration with the Alviso and Lower Guadalupe Collaborative (ALGC). The Plan provides a history of the project, establishes project objectives, and defines a proposed scope of work, schedule, and costs for the project.

---

[2] District Act § 4(g).

~~[3] ibid. § 5.16.~~

[4] Ends Policy 3.1; Governance Policies of the Board of Directors, 1999.

1.2.3 Project Objectives and Alternatives

Project objectives aid in identifying a range of suitable and feasible project alternatives. Based on the 2004 Board directives, and working in a collaborative effort with members of the Alviso community, the following project objectives were established:

- Restore Alviso Slough's channel width, and habitat to prior to 1983 conditions;
- Improve the community's ability to pursue navigation, public access, and aesthetics to allow for the expansion of boating and other recreational and/or tourism opportunities;
- Maintain one percent flood protection in Alviso Slough;
- Reduce mosquito nuisance; and
- Promote the integration of the Alviso Slough Restoration Project with the South Bay Salt Pond (SBSP) Restoration Project (including the SBSP Phase 1 Action at Pond A8) to re-establish the saltwater connection to the Lower Guadalupe River.

An important purpose of the Project, one that is strongly supported by the ALGC, is to restore the uses and configuration of the slough to near pre-1983 conditions so as to enhance navigation, water and land-based recreation (including access and trails), and natural aesthetics in and around the slough (including more open water habitat). Vegetation removal and/or dredging would be needed in order to achieve this purpose. The year 1983 was selected because (a) the longstanding residents of Alviso confirm this year to be one of the last years in memory when navigation, recreation, and aesthetics were not significantly diminished by an abundance of sediment and vegetation, and (b) documented information about the channel conditions (e.g., width and depth) in the slough are available.

Given the limited opportunities in South San Francisco Bay for water-based and wildlife-oriented recreation, this Project is intended to benefit not only the local residents but also the visitors who enjoy boating, walking, bird-watching, hunting, biking, and general sightseeing in this area. There is also potential for this Project to benefit the local business community, residents, and visitors alike by potentially indirectly spurring recreation- and community-based business.

Additionally, the boat launch ramp planned by Santa Clara County as part of the Alviso Marina County Park expansion is identified as an access point in the 2007 Draft San Francisco Bay Area Water Trail Plan; the launch ramp might further increase the recreational use and demand in and around the slough. In this case, physical improvements to the slough and any resultant spurring of recreation and community-based business and activity in the town of Alviso could further enhance the recreational opportunities/enjoyment in this area.

Coordination of this Project with the SBSP Restoration Project and the Alviso Marina County Park expansion project (both presented in more detail later in Section 1.4 of this Chapter) could provide greater and timelier enhancements to the slough than could any of the projects alone. Specifically, the Phase 1 Action of the SBSP Restoration Project (this includes the Pond A8 Phase 1 Action, located adjacent to the slough) would not fully achieve the purpose of the Alviso Slough Restoration Project in terms of added width or depth[5]. Additionally, any improvement to Alviso Slough as a result of the Phase 1 Action may take up to 10 years. By coordinating the Alviso Slough Restoration Project with the SBSP Restoration Project, significant slough widening could be realized in the short term and then, ideally, would be fully sustained by future actions of the SBSP Restoration Project (>10 years).

After a thorough review of a range of potential actions, six feasible alternatives (each a possible project) were selected for detailed study in this ~~Draft~~ Environmental Impact Report (EIR), including the required No Project Alternative. These alternatives are described in Chapter 2.

The Alternatives evaluated in this EIR are:

- Alternative 1: Vegetation and Root Mass Removal (2.6 acres) to a 4-foot depth;
- Alternative 2: Vegetation and Root Mass Removal (7.0 acres) to a 4-foot depth;
- Alternative 3: Vegetation and Root Mass Removal and Dredging (3.7 acres) to an 8-foot depth;
- Alternative 4: Vegetation and Root Mass Removal and Dredging (6.2 acres) to a 16-foot depth;
- Alternative 5: Vegetation and Root Mass Removal (15.3 acres) to a 4-foot depth + additional Dredging (9.7 acres) to a 10-foot depth; and
- Alternative 6: No Project.

1.3 THE ENVIRONMENTAL REVIEW PROCESS

The District has determined that implementation of the Alviso Slough Restoration Project could have a significant effect on the environment and therefore requires preparation of an EIR pursuant to the California Environmental Quality Act (CEQA). As the Lead Agency under CEQA, the District has prepared the Draft and Final EIRs to provide the public and regulatory agencies with information about the potentially significant environmental effects of the project, to identify possible ways to minimize the potentially significant effects, and to describe and evaluate feasible alternatives to the project. This EIR has been prepared in compliance with the CEQA of 1970 (as amended), codified in California Public Resources Code Sections 21000 et seq. and the CEQA Guidelines, codified in the California Code of Regulations, Title 14, Division 6, Chapter 3.

1.3.1 Scoping

Early consultation with persons or organizations concerned with the potential environmental effects of the project is required when preparing an EIR.

The District submitted the Notice of Preparation (NOP) of this ~~Draft~~ EIR to the California Office of Planning and Research (OPR) on August 11, 2007. The NOP was distributed to responsible and trustee agencies, as well as all other interested parties. The purpose of the NOP was to solicit comments from public agencies on issues germane to that agency that should be considered in the ~~Draft~~ EIR.

---

[5] Implementation of the SBSP Phase 1 Action at Pond A8 has the potential to sustain a wider channel along Alviso Slough (50 to 90 feet wider at the SBYC). The precise footprint of that scour cannot be predicted, but it is estimated that two to five acres of marsh would be removed in the Alviso Slough Restoration Project area. The Phase 1 project is not expected to significantly deepen the slough or sustain a dredged depth in the slough. This does not meet the project objective to restore the area to pre-1983 conditions.

Public comments were received by mail and e-mail during the 30-day public scoping period, August 14 to September 14, 2007. As part of the scoping process, a public scoping meeting was held on August 30, 2007 in Alviso to solicit comments on environmental issues to be addressed in the EIR. All of the issues raised in the NOP comment letters (Appendix A) have been addressed in the ~~Draft~~ EIR

The following is a brief summary of the information and opinions received during the scoping period.

Comments on Project Description / Purpose and Need

The public scoping comments received from agencies and the public indicated that the EIR should:

- Investigate the potential for increased tidal exchange at Pond A8 to meet the Project objectives before pursuing actions that would have significant impacts on water quality and wetland habitat; and
- Consider the natural (historic) flow and meandering nature of the Guadalupe River.

Other public comments included the following opinions and observations:

- The community would like Alviso to be protected from flooding, and would like to see more tourists and boat owners docking their boats here for recreational purposes;
- Alternatives 1, 2, and 3, do not meet community's objectives and Alternative 5 does;
- In 1982, there was no vegetation in the slough and water depth under the docks was 12 feet;
- Environmental and social injustice has occurred in Alviso;
- Objectives suggest that 1983 conditions are better than current conditions. The ~~Draft~~ EIR must be supported by science-based information or assumptions; and
- Improvements to the existing boating access by the Alviso Marina County Park Improvement Project will provide additional recreation access at the cost of impacts to water quality.

Comments on Setting, Impacts and Mitigation

The comments received indicated that the EIR should:

- Address biological, water quality and other impacts related to the project activities, including downstream impacts;
- Address how this activity would impact turbidity and suspension of inorganic and methyl mercury;
- Describe the impacts from removing the abandoned vessels;
- Address global climate change effects;
- Describe populations of listed and unlisted species that use the area; and
- Address how dredging work windows must be established to protect certain species.

Other comments or suggestions included:

- Projects that would substantially harm tidal marshes or tidal flats should be allowed only for purposes that provide substantial public benefits and only if there is no feasible alternative;
- Sufficient sediment sampling will be needed to characterize the contaminant levels in the dredged materials; and

- Regulatory preference is for beneficial re-use of dredged material, where feasible.

1.3.2 Draft EIR

The CEQA Guidelines, Section 15126.6(a), state that an EIR must describe and evaluate a reasonable range of alternatives to the proposed project that would feasibly attain most of the project's basic objectives, but that would avoid or substantially lessen any significant adverse environmental effects of the project. An EIR is not required to consider every conceivable alternative to a proposed project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation. CEQA Guidelines Section 15126.6(e) states that, "[t]he specific alternative of 'no project' shall also be evaluated along with its impact." The EIR must evaluate the comparative merits of the alternatives and include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison.

Pursuant to the CEQA Guidelines, the Draft EIR, along with a Notice of Completion, must be filed with the OPR for state agency review. Copies of the Draft EIR ~~will be~~ were filed with OPR and distributed by OPR and distributed by the District to local stakeholders and parties of interest and available for public review on the District's website ~~(http://www.valleywater.org/Water/Watersheds_-_streams_and_floods/Watershed_info_&_projects/Guadalupe/index.shtm)~~ and ~~will be~~ the DEIR was also available for public review at two local library branches:

- Alviso Branch Library: 5050 North First St., San José, (408) 263-3626; and
- Dr. Martin Luther King, Jr. Library: 150 E. San Fernando St., San José, (408) 808-2000.

Recirculation of the Draft EIR Section 3.2, Water and Sediment Quality, was also filed with the OPR for state agency review. Copies of the recirculated Draft EIR Section 3.2 were available for public review on the District's website and were available for public review at two local library branches:

- Alviso Branch Library: 5050 North First St., San José, (408) 263-3626; and
- Dr. Martin Luther King, Jr. Library: 150 E. San Fernando St., San José, (408) 808-2000.

1.3.3 Final EIR & Certification

Comments on the May 2008 Draft EIR and June 2009 Recirculated Draft EIR have been addressed in this Final EIR. The Final EIR incorporates changes suggested by comments on the Draft, as appropriate, and includes responses to all substantive comments received during the public review period. The Final EIR provides a full and fair discussion of the significant environmental impacts, and will inform the decision-makers and the public of reasonable measures and alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment. Copies of the Final EIR are available for review on the District web page and at the library locations shown above.

The final step in the CEQA process is certification of the Final EIR, which includes Board adoption of issuance of findings which ~~may~~ include the preparation of a Statement of Overriding Considerations ~~if the~~ since proposed project alternatives have~~s~~ the potential to result in unavoidable significant impacts. Certification of an EIR includes the following decisions and/or findings made by the District Board of Directors:

- The document complies with CEQA;
- It has reviewed and considered the Final EIR prior to approving the project; and it reflects their independent judgment and analysis; and
- Adoption of Mitigation Monitoring and Reporting Program (MMRP).

CEQA Section 21081.6(a) requires lead agencies to "adopt a reporting and mitigation monitoring program (MMRP) for the changes to the project which it has adopted or made a condition of project approval in order to mitigate or avoid significant effects on the environment." The MMRP is included in Chapter 5 of this EIR.

1.3.4 Other Approvals

Other approvals will be required to carry out any of the proposed actions being evaluated in the ~~Draft and~~ Final EIR~~s~~. The list of major permits and consultations required for this Project are identified below (these are presented in more detail in Chapter 3).

Federal

- U.S. Army Corps of Engineers (USACE): Clean Water Act Section 404 - Individual Permit for dredging and activities within Waters of the United States[6] (see Chapter 3 for more detail);
- U.S. Fish and Wildlife Service (USFWS): Endangered Species Act Section 7 Consultation;
- National Marine Fisheries Service (NMFS): Consultation under the Endangered Species Act, Section 7, and Magnuson-Stevens Fishery Conservation and Management Act; and
- Possible EPA clearance (Alviso area CERCLA National Priorities List [NPL][7] status).

State

- Regional Water Quality Control Board (RWQCB): Clean Water Act Section 401 - Water Quality Certification and/or Porter-Cologne Water Quality Control Act, Waste Discharge Requirement;
- California Department of Fish and Game (CDFG): California Endangered Species Act - Consultation for special status species, and California Wetlands Conservation Policy;
- Bay Conservation and Development Commission (BCDC): Administrative or Major Permit for dredging activities under the Federal Coastal Zone Management Act and State McAteer-Petris Act, California Coastal Act, and San Francisco Bay Plan;
- Office of Historic Preservation: National Historic Preservation Act (NHPA) - Section 106 Review;

---

[6] USACE may be required to prepare an Environmental Assessment (EA) for compliance with the National Environmental Policy Act (NEPA). At their discretion, they may also prepare an Environmental Impact Statement (EIS), which requires more rigorous analysis of impacts. The USACE has sole discretion to prepare and approve their EA or EIS, and issuance of the 404 Permit would be reliant on completion of their NEPA process. The USACE consults with other Federal and State Agencies before issuing or denying a permit, and an Individual Permit application is reviewed by the public. The U.S. Environmental Protection Agency (EPA) has oversight and enforcement authority over the USACE under the Clean Water Act, and can veto a permit issued by USACE. The District could not construct the project until this Federal process would be completed.

[7] The NPL is the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation. From this web site, you can locate NPL sites, check their cleanup progress, and get information on new and proposed NPL sites.

- California State Lands Commission (CSLC): Consultation for CEQA and leased lands; ~~and~~
- California State Department of Toxic Substances Control; and,
- California Department of Transportation (DOT): Transportation and Encroachment Permits.

Local

- City of San Jose Haul Route Permit; and
- City of San Jose Local Enforcement Agency (Hazardous Materials).

1.4 RELATED LOCAL PROJECTS

There are four ~~two~~ ~~key~~ projects currently underway in the vicinity of Alviso Slough: (1) the SBSP Restoration Project, ~~and~~ (2) the Alviso Marina County Park Improvement Project, (3) the City of San Jose Bay Trail Master Plan, and (4) the South San Francisco Bay Shoreline Study. A brief description of each will assist the reader in understanding the overall Project objectives and potential ~~impacts associated with~~ cumulative effects of the Alviso Slough Restoration Project. ~~The District does not have approval authority over these other projects, but project managers are working to coordinate their planning efforts and to share information wherever possible.~~

1.4.1 South Bay Salt Pond Restoration Project

Concurrent with this effort for Alviso Slough, environmental review of the SBSP Restoration Project, led by a consortium of agencies (California Coastal Conservancy, USFWS, and CDFG), is also underway. The combined Final CEQA/NEPA document (referred to as the *SBSP Restoration Project Final Environmental Impact Statement/Report [EIS/R]*) was issued in December 2007. It evaluates the proposed SBSP Restoration Project on a programmatic level, and includes specific analysis of the proposed initial actions, including the Phase 1 Action at Pond A8 within the Alviso pond complex.[8] The District has reviewed the EIS/R as a Responsible Agency, as it will be carrying out improvements associated with Pond A8.

Pond A8 is located immediately adjacent to the Alviso Slough Restoration Project site (see Figure 1-2), and has been proposed as one of several locations for initial implementation of the SBSP Restoration Project (known as the *Phase 1 Action*). This Phase 1 Action includes connecting Pond A8 to Alviso Slough with a 20 to 40-foot wide notch. At this time, the SBSP Restoration Project is not approved; the discussion contained in this Alviso Slough Restoration Project EIR is based on information contained in the SBSP Restoration Project EIS/R.

Implementation of the Phase 1 Action at Pond A8 aims to introduce limited tidal action to create approximately 1,400 acres of muted subtidal habitat in Ponds A8, A5, and A7. Partial restoration of tidal prism in these ponds is expected to induce limited channel scour and increase salinity along Alviso Slough. Over time (1 to 10 years, depending on how the Phase 1 hydraulic structure is managed), this Action would also restore more natural tidal processes that discourage sedimentation and promote scour along the channel of Alviso Slough. These changes could, at least partially, scour and deter the re-establishment of marsh vegetation along the banks of the Slough by maintaining a slightly wider channel, particularly near the notch between Pond A8 and Alviso Slough. Based on modeled hydraulic geometry results for the SBSP Restoration Project, 20-foot and 40-foot wide notch openings at Pond A8 would widen the current channel width by approximately 50 to 90 feet, respectively, in the vicinity of the South Bay Yacht Club (SBYC). Open water in the Alviso Slough channel is predicted to be 100 to 140 feet wide between the notch and SBYC. Modeling results and hydraulic geometry analysis suggest that implementation of the proposed SBSP Phase 1 Action at Pond A8 would not result in measurable changes to the channel width along the downstream (bayward) half of the slough (downstream of the Alviso Slough Restoration Project's Project area).

---

[8] The Alviso pond complex is one of the three project boundaries of the SBSP Restoration Project. The Alviso pond complex consists of 25 ponds on the shores of the South Bay in Fremont, San Jose, Sunnyvale and Mountain View, in Santa Clara and Alameda counties, including Pond A8. The pond complex is bordered on the west by the Palo Alto Baylands Nature Preserve and Charleston Slough, on the south by commercial and industrial land uses as well as NASA Ames Research Center and Sunnyvale Baylands Park, and on the east by Coyote Creek in San Jose and Cushing Parkway in Fremont.

The precise footprint of the SBSP Restoration Project Phase 1 Action scour in Alviso Slough cannot be predicted, but it is estimated that approximately three to five acres of marsh would be removed within the Alviso Slough Restoration Project area (see Table 1-1). Future SBSP actions (10 years and beyond) could provide additional benefits to the slough (e.g., sustained scouring).

Table 1-1 Projected Marsh Scour with Varying Pond A8 Notch Widths

Width of Notch	Channel Widening as a Result of Notch	Total Estimated Marsh Scour
20 ft	50 ft	2 acres
40 ft	90 ft	5 acres

Timely coordination of the greater SBSP Restoration Project and the Alviso Slough Restoration Project could maximize the public recreation benefits of both projects. Implementation of the Alviso Slough Restoration Project concurrent with the SBSP Phase 1 Action could direct the added scour from the Phase 1 Action into areas that would enhance recreational boating (especially adjacent to the notch location, which, is at present located immediately upstream of the SBYC docks), and thus help to maintain some or all of the new channel width created from implementation of the Alviso Slough Restoration Project.

In brief, the Alviso Slough Restoration Project could accomplish in the very near term a portion of the channel widening that the SBSP Restoration Project could (if approved) accomplish over a much longer period of time. Conversely, the SBSP Restoration Project could provide sustainability for a larger slough channel over the long term, and lessen or avoid the need for ongoing maintenance dredging and/or vegetation removal associated with the Project.

The Alviso Slough Restoration Project EIR addresses future conditions under two scenarios: (a) the Phase 1 Action is not implemented or is not successful, and (b) the Phase 1 Action is successful and will ultimately provide additional scour in the Project area.

1.4.2 Alviso Marina County Park Improvement Project

The Santa Clara County Department of Parks and Recreation is currently planning an expansion of the existing Alviso Marina County Park, including a new boat-launching concrete ramp, docking facilities for small non-motorized watercraft such as kayak and canoes, and vehicle/trailer parking lot. This launch site is identified as an access point in the 2007 Draft San Francisco Bay Area Water Trail Plan; an objective of the Water Trail is to link access points around the Bay. The project is located adjacent to Alviso Slough on a 1.8-acre parcel acquired by Santa Clara County from the federal government (see Figure 2-2 in Chapter 2). Design and environmental review of this facility are currently underway. Because funding is in place and design of the park expansion has been initiated, this EIR assumes that the park expansion project will occur in 2009, before construction of the Alviso Slough Restoration Project. The Final EIR for the Alviso Marina County Park Boat Launching Facility was certified in 1997. An addendum to that Final EIR was filed in January 2009 to review the environmental impacts and mitigations identified in the 1997 Final EIR and determine if other impacts may exist in light of current environmental and project conditions. The Addendum also identifies new impacts of the project that result from other new projects in the area, including the Alviso Slough Restoration Project. A public notice was issued on June 17, 2009 by the U.S. Army Corps of Engineers regarding the project application pursuant to the provisions of Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act of 1972.

1.4.3 City of San Jose Bay Trail Master Plan

The City (City) of San Jose has completed a Master Plan (Plan) for the Bay Trail that includes trails along the southern boundary of the Project area. A future pedestrian bridge spanning Alviso Slough is planned by the City. It has completed a Feasibility Study that describes the bridge and the three under-crossing structures beneath the future bridge, UPRR Railway and the Gold Street bridges. More information about the Master Plan for the Bay Trail, including drawings and maps can be found at http://www.sjparks.org/Trails/Bay/BayTrail.asp.

1.4.4 South San Francisco Bay Shoreline Study

The South San Francisco Bay Shoreline Study was originally authorized by Congress in 1976 to assess the need for flood protection in the South Bay. The Shoreline Study area extends along South San Francisco Bay including the shoreline and floodplain areas in the counties of Alameda, San Mateo, and Santa Clara.

On October 24, 2005, USFWS, the USACE, the District, and the Coastal Conservancy began the first stage of the Shoreline Study – the Alviso Ponds and Santa Clara County Interim Feasibility Study; this feasibility study includes the Alviso Slough Restoration Project area.

1.4.5 Port of Alviso with Navigation Channel/Emergency Access

In early 2009, the San Jose Silicon Valley Chamber of Commerce (Chamber) and the Santa Clara Valley Water District (District), requested a grant to develop a plan to create a port in the Alviso area. The overall goal is to allow the community of Alviso to return the slough to the historic advantages of an operating port and its accompanying economic and community benefits. With the accomplishment of this objective, significant new employment and revenue will be generated upon completion of the development phase.

1.5 ORGANIZATION OF THIS EIR AND INTENDED USE

This Final EIR includes: a description of the range of possible actions in Chapter 2; a description of the environmental setting, an analysis of possible impacts, and identification of mitigation in Chapter 3; an analysis of cumulative impacts in Chapter 4; and a MMRP in Chapter 5. In addition, this Final EIR includes all text changes, corrections of minor errors and other revisions to address the comments received on the Draft EIR.

An Engineer's Report, prepared in conjunction with the Draft EIR, initially evaluated Alternative 5 in more detail as the "Recommended Alternative." After review of comments on the Draft EIR, and the volume of concerns about cost-effectiveness, project sustainability and environmental impacts, the District has changed its Staff-Recommended Alternative to Alternative 3. Alternative 3 is less costly than Alternative 5 and has fewer potential environmental impacts due to the reduced area of vegetation and root mass removal and dredging (3.7 acres versus 15.3 acres) and the lower depth of dredging (8 feet versus 9.7 acres dredged to 10 feet).

This changed Staff recommendation for a smaller, less impacting project does not preclude selection of any of the alternatives presented in this Final EIR as moving forward as the District's proposed project. The Engineer's Report was available for public review simultaneously with the Draft EIR.

The District, as the Lead Agency for this project, will use this Final EIR in conjunction with the Draft Engineer's Report, in consideration of approval of the Project. This document provides environmental information for the District and for the various other agencies that exercise control over certain aspects of the Project, as identified in Section 1.3.4.

This page intentionally left blank.

2. Description of the Alternatives

2.1 OVERVIEW

The primary purpose of the Project is to restore Alviso Slough to pre-1983 conditions, when a more open water habitat allowed for better navigation and recreation in the area. After review of a range of potential actions, including a public scoping process, six alternatives were selected for detailed study in this EIR, including the required No Project Alternative. The primary methods for completing the action alternatives would be vegetation removal or dredging, or a combination of the two methods. The Santa Clara Valley Water District (District) will select the proposed Project based on environmental and engineering analysis as well as public input following publication of the ~~this~~ Draft and Final EIRs. The Environmentally Superior Alternative is identified in Section 2.6.

2.2 ALTERNATIVES SCREENING

2.2.1 Screening Process and Alternatives Eliminated from Further Study

A range of alternatives for evaluation in this EIR was determined based on the following considerations:

- Project objectives (see Chapter 1);
- Sustainability;
- Environmental factors, including permitting requirements;
- Community feedback; and
- Engineering feasibility.

Some potential alternatives were rejected because they did not meet the above criteria. The actions/alternatives that were eliminated from further study and the reasons for their elimination are discussed below.

Ferry Terminal Alternative

This alternative would involve developing a ferry terminal in Alviso for commuters and/or cargo handling. A ferry terminal would require extensive deep dredging and regular maintenance of the slough and basin for ferryboat operations, which also would encourage recreation and tourism in the area. Such an action could not be pursued by the District (the District does not have government mandate for these services), but would have to be implemented by the San Francisco Bay Area Water Transit Authority which has regional jurisdiction in this area, perhaps in partnership with the City of San Jose which has land use jurisdiction, and the U.S. Army Corps of Engineers (USACE). The Water Transit Authority has not identified Alviso as a future location for a South Bay ferry terminal, although nearby Moffett Field is under consideration. For these reasons, this alternative was rejected for further study.

Environmental Enhancements Only Alternative

This alternative would focus exclusively on removing any identified hazardous sediments from the slough. To implement this alternative, an extensive study of sediment quality would be required, and the location and intensity of contamination, if any, would then be identified. Any subsequent sediment removal would focus only on areas of contamination and/or hazard and not on areas for recreational or navigational enhancement. As such, this alternative would not meet the Project objectives and was therefore rejected for further study.

Land-Based Enhancements Only Alternative

This alternative would focus solely on land-based recreational enhancements in Alviso, such as providing additional public access, trails, or other facilities near the slough. Initial research revealed that city and regional recreational planning efforts are already underway with an objective to improve many aspects of public access and trail use in the Project area. Additionally, while focusing on land-based recreational enhancements would avoid many anticipated impacts of vegetation removal or dredging in the slough, it does not meet the primary Project objective of restoring the slough's channel width to pre-1983 conditions; therefore, this alternative was rejected for further study.

Community-Based Financing Alternative

For this alternative, channel modification would be undertaken by funding through a Community Benefits District (CBD; sometimes referred to as an assessment district). A CBD is an instrument that provides funds for the regular maintenance and upkeep of public improvements, and is funded by an assessment fee assigned to all properties that receive the benefit of the improvements. In a CBD:

- Fees are assessed on property owners, who may, in some cases, be able to partially pass through some costs to property tenants and area customers;
- A board is formed to oversee the CBD's operations, collect assessments, and disburse funds for supplemental services, activities, and improvements, as agreed to by the community members;
- Funds collected from the CBD are used solely for the maintenance and replacement of items within that CBD, such as streetscapes and other physical improvements in the community; and
- In Alviso, a CBD could be used to fund some or all of the vegetation removal and continuing maintenance in the slough area.

When undertaking the development of a CBD, several important issues must be considered. A CBD can only be established by a majority vote of the property owners and the adoption of an ordinance by a city council. However, a CBD or Financing District formation is usually a function of the City of San Jose or County of Santa Clara who normally would have expertise in this area. For these reasons, this alternative was rejected for further study as a part of this project.

Restore Previous Guadalupe River Channel Connection Alternative

This alternative would involve the restoration of the historical Guadalupe River channel within the Project area. The Guadalupe River formerly flowed northwest, through what is now Pond A8, and entered South San Francisco Bay (South Bay) through Guadalupe Slough. Commercial shipping in the South Bay began to increase in the 1840s, and ships sailed up the Guadalupe Slough to offload or load goods at a dock on the Guadalupe River. In the early 1850s, boatmen familiar with the location observed that another slough from the Bay ended close to the dock. At some point in the 1850s, locals, using a horse-drawn "Madison" dredger, connected the Guadalupe River and the other slough. The latter became known as Steamboat Slough, and was the preferred shipping route from the Bay to Alviso, as it was nearly a mile shorter than Guadalupe Slough (Burrill and Rogers, 2006). For a period of approximately 50 to 60 years, the Guadalupe River bifurcated as it reached the current location of the South Bay Yacht Club (SBYC).

Part of its flow continued down Steamboat Slough to the Bay, and the remainder wound its way along Guadalupe Slough. With the creation of the salt evaporation ponds in the 1940s, the dikes that border Pond A8 on its east side completely severed the Guadalupe River flow from Guadalupe Slough, and the river flowed to the Bay only via Steamboat Slough, which eventually became known as Alviso Slough. An early marina was created on the west side of the slough at precisely the point where the river would have crossed the new salt pond. Both sides of Alviso Slough were leveed to create the salt ponds in the 1940s.

Recreating the former Guadalupe River channel would require major planning and re-engineering of the current levee system that provides flood protection to Alviso. In addition, for such an undertaking to be sustainable, an extensive restoration planning effort would be necessary—not only for the immediate Project area, but for a much greater area. Furthermore, a connection between Alviso Slough and Pond A8 is currently planned as part of the South Bay Salt Pond (SBSP) Restoration Project, and this connection must be in a stable, accessible location so that the Project sponsors can monitor its success as well as any ecological changes that might result. Over time, the SBSP Restoration Project could promote a permanent connection between Pond A8 and Alviso Slough. For these reasons, this alternative was rejected for further study.

2.3 PROJECT ACTIONS

Each of the action alternatives would include vegetation removal and/or dredging, as described below. Section 2.4 presents individual discussions of the five proposed alternatives. Section 2.5 describes construction methods and sequencing in more detail.

2.3.1 Vegetation Removal Method

Vegetation removal proposed under the Alviso Slough Restoration Project would involve removing plant material as well as the roots to a maximum depth of four feet. Figure 2-1 presents a typical cross-section of Alviso Slough and the 4-foot vegetation and root mass removal scenario.

There are three basic vegetation removal methods for aquatic environments: mechanical removal (mowing, rotary tilling); hand removal (chain saws, weed-eaters); and chemical removal (herbicide application). For this Project, the majority of vegetation removal would be accomplished by rotary tilling to a depth of up to four feet, with limited hand removal in areas where it is not feasible to use mechanical equipment. Chemical application is not being considered because it would remove vegetation, but not root mass, from the slough, and would thus not meet the project objective of widening the slough channel.

Mechanical harvesting of vegetation in aquatic environments can be a cumbersome task, depending on the site's particular hydrology and access points. A multipurpose aquatic maintenance vessel, such as an Aquamog, can provide a means for removing vegetation and the root mass. Such a vessel performs the same tasks on water as backhoes and excavators perform on land. The vessel includes clamshells for dredging, slotted clambuckets for vegetation removal, rotary tillers for vegetation root-mass removal, and rotary mowers for shoreline vegetation control.

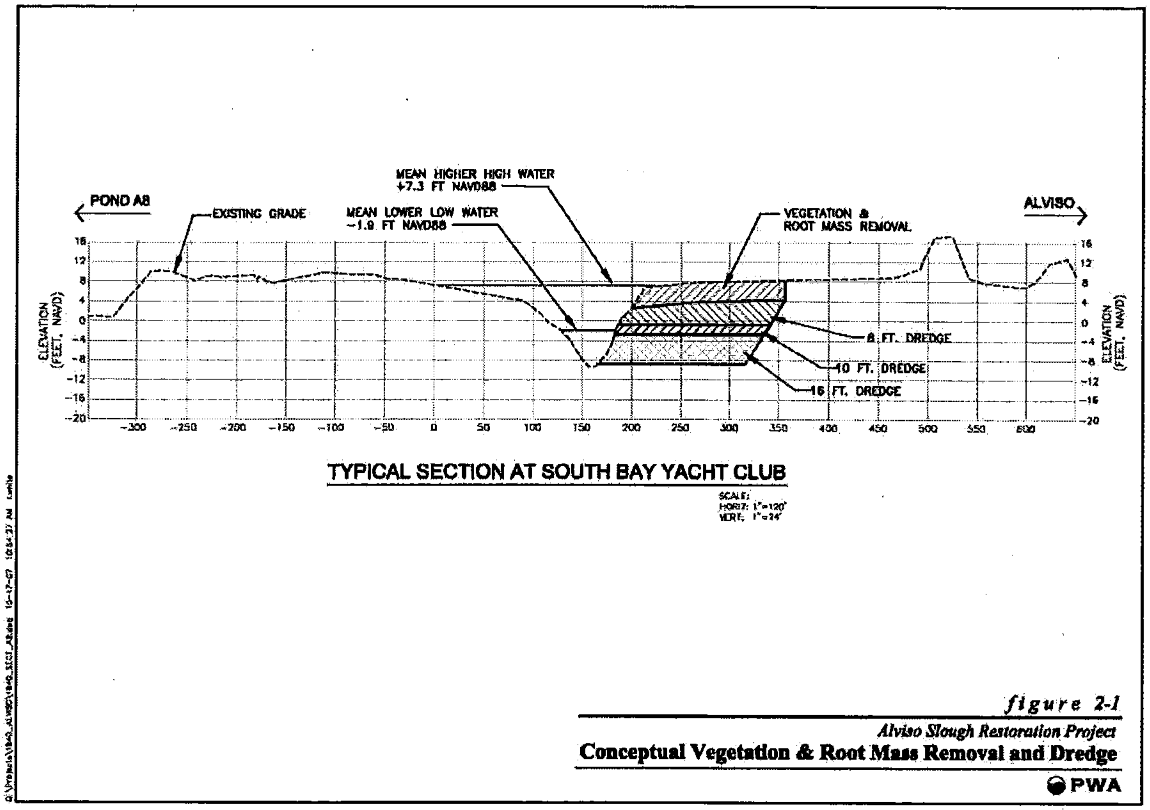


Figure 2-1 Typical Cross Section in Alviso Slough

The rotovation method is often used for long-term aquatic vegetation control. The blades on the rotovator can till and/or dislodge plant roots at a rate of approximately 0.5 acre per day and remove 100 percent of root material with minimal sediment. This method first involves cutting the vegetation down to the water surface, then tilling the submerged vegetation and its root mass with the rotovator. An aquatic weed harvester is then used to collect the vegetation debris. A turbidity screen is placed around the vegetation removal area to prevent impacts on water quality due to any floating debris from the removal process. Limited hand removal may be required in tight or shallow areas, such as in and around existing boat dock piers. Typically, hand removal does not guarantee removal of the entire root mass.

Removal of the vegetation root material only (without dredging) would result in only a minimal (up to 1-foot) deepening of the slough bottom, which may vary depending on the location, extent of root mass, etc. Furthermore, while some newly loosened sediment (especially in the area opposite of the Pond A8 notch if open) could be transported downstream, a sizable portion would likely be re-deposited in place or on downstream mudflats.

Harvested plant material need not be dried prior to off-site waste disposal. The material would be transferred to a haul truck at the slough and hauled either to a staging area or to the Zanker Road Landfill, which is expected to compost the material for re-use (see Figure 2-7)[1]. Because vegetation would be harvested faster than it could be hauled to the disposal facility, a nearby staging area would be used to store some of the material for a few days or more until all of it can be hauled to the Zanker Road Landfill facility.

---

[1] Note: Zanker Road Landfill will accept vegetation; Newby Island Landfill will accept the dredged sediment.

2.3.2 Dredging Methods

Three of the alternatives evaluated in this EIR include dredging to 8-feet, 10-feet, or 16-feet below existing grade. Figure 2-1 presents a typical cross-section of Alviso Slough and of the dredging scenarios. The 8-foot dredge option was identified to maintain a minimum keel draft (depth) clearance for smaller recreational boats while also minimizing the impacts that could result from extensive dredging in the slough and from hauling removed sediments to the disposal site. The 10-foot dredge option was selected because it more closely mimics the conditions that existed around 1983.

Based on an assumed sedimentation rate of 1–2 feet per year (PWA 2007 and Ruth and Going Inc. and others 1980), it has been determined that a deep dredge to approximately 16 feet below existing grade could delay marsh re-establishment by up to a decade. This depth was selected because it is close to the equilibrium channel depth after implementation of the tidal action proposed for the SBSP Restoration Project over 10 years or more (see Chapter 1 for more information on the near-term SBSP Phase 1 Action).

Dredging methods have been developed per the recirculated DEIR (see revised Section 3.2, pages 3.2 – 25, 26) to include 1) sediment/coring , 2) over dredging if needed or required, 3) disposal in upland habitat or for wetland foundation, and 4) hydraulic dredging (suction dredging) versus mechanical dredging.

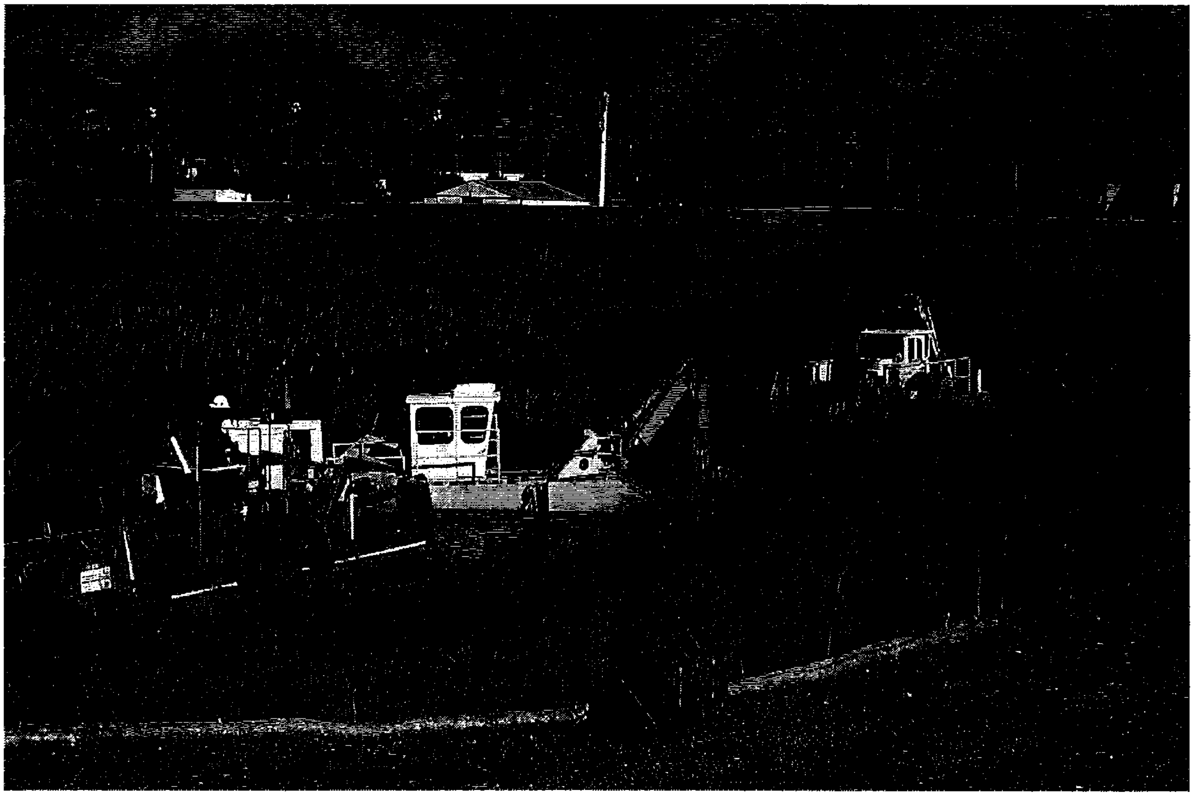


Photo courtesy Aquatic Environments, Inc.

Photo 1 Multiple construction equipment can work in an area simultaneously

~~Dredging would be accomplished by employing a multipurpose aquatic maintenance vessel, as discussed above, for vegetation removal.~~ The removed material would be dried at a nearby staging area for 3 to 10 days prior to being trucked to the Newby Island Landfill for disposal (see above).

The removal of the dredged material from the slough would occur at a much faster rate than it could be dried and hauled to the landfill for disposal. Thus, the in-stream work would cease when all the material is dredged (or at the end of the allowable construction season), and the material, which would have been brought to staging areas to dry, would continue to be hauled daily to the landfill for many weeks or months thereafter.

Analysis of sediment samples collected in the past year in Alviso Slough along with other data suggests that the concentrations of contaminants like mercury and polychlorinated biphenyls (PCBs) would limit options for re-use and disposal of dredged sediment. Based on the information known to date, it is assumed that the dredged material would not be suitable for re-use as wetland material. Upland disposal options also would be limited, both by the quality and the quantity of the material. The nearby Zanker Road Landfill has indicated in early communications that the amount of sediment that would be generated by this Project is beyond what they accept on a daily basis. The next nearest suitable landfill for disposal of this material would be the Newby Island Landfill in Milpitas, California; the landfill operator has indicated that this material could be accepted for disposal, but requires specific testing to ensure the sediment quality does not reach hazardous levels.

2.3.3 Removal of Abandoned Vessels and Navigational Hazards

All of the action alternatives would include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by the Bay Conservation and Development Commission (BCDC), California State Lands Commission (CSLC) the District, and the SBYC. All procedures as required by state law would be followed to identify the owners of vessels in the Project area, and those owners would be responsible for moving vessels from the Project area before construction would begin. Seven vessels have already been removed; any additional vessels that are ~~Any vessels~~ determined to be abandoned ~~(of which there are approximately seven identified at this time)~~ would be salvaged for sale, or would be dismantled and discarded. All procedures would follow the California Department of Boating and Waterways guidelines for abandoned boat removal.

Removal of vegetation and root mass and/or dredging would be performed around and under the existing active docks and piers on the east side of Alviso Slough within the Project area. If active piers or docks are damaged or displaced in the process, they would be re-installed after completion of work.

2.4 PROJECT ALTERNATIVES FOR STUDY

Five action alternatives and the CEQA required No Project Alternative are included in ~~this~~ the Final EIR for detailed study:

- Alternative 1: Vegetation and Root Mass Removal (2.6 acres) to a 4-foot depth;
- Alternative 2: Vegetation and Root Mass Removal (7.0 acres) to a 4-foot depth;

- Alternative 3: Vegetation and Root Mass Removal and Dredging (3.7 acres) to an 8-foot depth;
- Alternative 4: Vegetation and Root Mass Removal and Dredging (6.2 acres) to a 16-foot depth;
- Alternative 5: Vegetation and Root Mass Removal (15.3 acres) to a 4-foot depth and Dredging (9.7 acres) to a 10-foot depth; and
- Alternative 6: No Project.

Alternatives 1 through 6 are summarized in Table 2-1 below. The Project timeline covers initial construction and maintenance over the first 10-year period. This period was selected because the SBSP Restoration Project could be providing scouring benefits to the slough at that time, possibly reducing or eliminating the need for dredging and/or vegetation removal maintenance as part of the Alviso Slough Restoration Project. If the SBSP Restoration Project is not implemented or is not successful in Alviso Slough, the maintenance required to sustain the new benefits by Alternatives 1 through 5 would be required indefinitely.

Table 2-1 Summary Description of Alternatives

Project Elements	Alt. 1 Vegetation and Root Mass Removal (2.6 acres)	Alt. 2 Vegetation and Root Mass Removal (7.0 acres)	Alt. 3 Vegetation and Root Mass Removal And Dredge to 8-foot Depth (3,7 acres)	Alt. 4 Vegetation and Root Mass Removal and Dredge to 16-foot Depth (6.2 acres)	Alt. 5 Vegetation/ Root Mass Removal (15.3 acres) and Dredge to 10-foot Depth (9.7 acres)	Alt. 6 No Project[3]
Length of slough affected by project work (feet)	1,400	3,400	2,300	2,200	3,300	0
Width of slough affected by project work (feet)	30 – 100	40-200	20 - 150	100 - 200	100 - 850	0
Current average width of slough between Gold Street and County Marina (feet)[1]	50	50	50	50	50	50
Resultant average width of slough between Gold Street and County Marina (feet)[2]	80[3]	130	100	110	160	50[3]

Notes:

[1] Average width of slough before and after implementation of alternatives was determined based on approximately 10 equi-distant transects between Gold Street and the County Marina. The current average width of open water between Gold Street and County Marina was field measured on February 1, 2007.

[2] The resultant width of the slough after construction does not imply adequate depth for all boats at all tides. The widths do not include changes associated with the SBSP Phase 1 actions (see footnote 3)

[3] The Alternative 1 and No Project values of 80 and 50, respectively, do not consider the SBSP Phase 1 actions. The SBSP Phase 1 notch at Pond A8 is predicted to increase the average width of slough between Gold Street and County Marina by 50 to 90 feet, or to an estimated slough width of 100-140 feet, and resultant average width of 120 feet. Such action could potentially increase the resultant widths of Alternatives 1 and 6 as shown in the table. The other alternatives are predicted to attain a channel width as shown in table with or without the SBSP Phase 1 action.

2.4.1 Alternative 1: Vegetation and Root Mass Removal (2.6 acres) to a 4-foot Depth

Description

Alternative 1 includes removal of approximately 2.6 acres of vegetation and root mass to a depth of 4 feet, as shown in Figure 2-2. The footprint of this alternative would be limited to areas that would most benefit from navigational enhancements, and significantly minimize the area of potential environmental impact as compared to the other alternatives.

Vegetation and root mass removal alone (without dredging) would not significantly alter the depth of the slough, as only the root mass and the small amount of sediment attached to the root mass would be removed. While this alternative would not restore the width of the slough to pre-1983 conditions, it would provide improvements to navigation and access for small boats in the vicinity of the SBYC.

Vegetation and root mass removal over 2.6 acres would yield approximately 8,320 cubic yards (c.y.) of wet plant material. Assuming that vegetation removal would proceed at 0.5 acre per day per Aquamog, in-water construction of this alternative would require less than 10 days. Hauling the material to the Zanker Road Landfill would take an additional nine days (see Table 2-2).

As described in Section 2.3.3, all action alternatives include the removal of navigational hazards from the Project area if not already resolved by the BCDC, CSLC, the District, and SBYC by the time of commencement of construction of this project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Maintenance

Marsh vegetation would rapidly re-colonize the cleared section, and improvements to navigation would be short-lived without repeated maintenance of the Project area. Using the rotovater method described above, this alternative would require regular maintenance. Without the SBSP Phase 1 Action at Pond A8, approximately 3 rounds of vegetation and root mass removal would be required for each 10-year maintenance cycle.

Implementation of the SBSP Phase 1 Action at Pond A8 has the potential to sustain a wider channel along Alviso Slough (50 to 90 feet at the SBYC). The precise footprint of that scour cannot be predicted, but it is estimated that two to five acres of marsh would be removed along Alviso Slough in the Alviso Slough Restoration Project area. If the Phase 1 Action is successful, little to no ongoing mechanical maintenance would be required to sustain the 2.6 acre footprint of vegetation and root mass removal under Alternative 1.

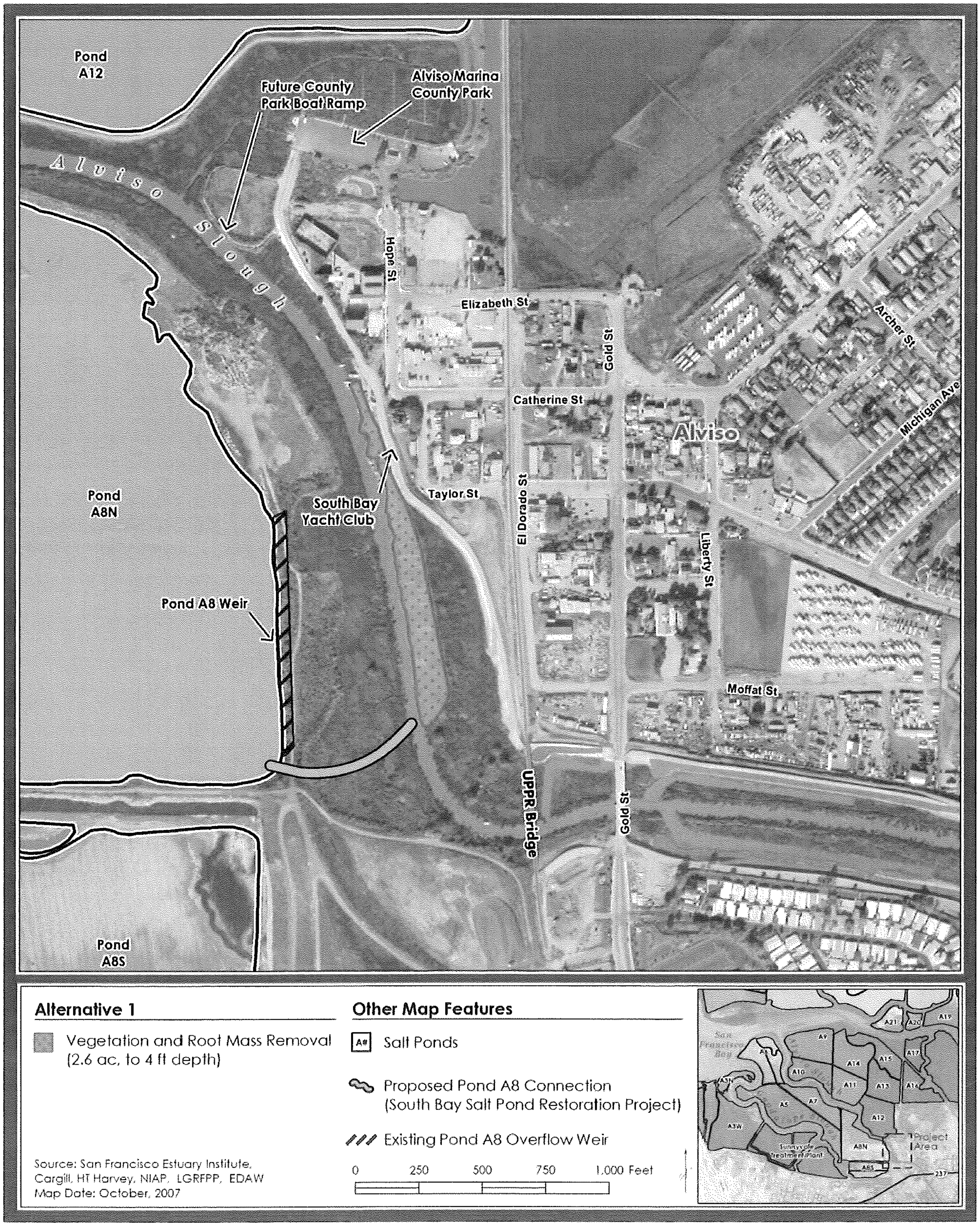
2.4.2 Alternative 2: Vegetation and Root Mass Removal (7.0 acres) to a 4-foot Depth

Description

Alternative 2 would remove approximately seven acres of vegetation and root mass to a depth of four feet on both sides of the slough, as shown in Figure 2-3. While this alternative would not restore the width of the slough to pre-1983 conditions, it would improve navigation and access for smaller boats in the vicinity of the SBYC. However, as with Alternatives 1 and 5, the vegetation and root mass removal to 4 feet would not significantly alter the depth of the slough, as only the root mass and the small amount of sediment attached to the roots would be removed.

Alviso Slough Restoration Project

Figure 2-2:
Alternative 1



Source: San Francisco Estuary Institute, Cargill, HT Harvey, NIAP, LGRFPP, EDAW
Map Date: October, 2007

Table 2-2 Construction Description Summary

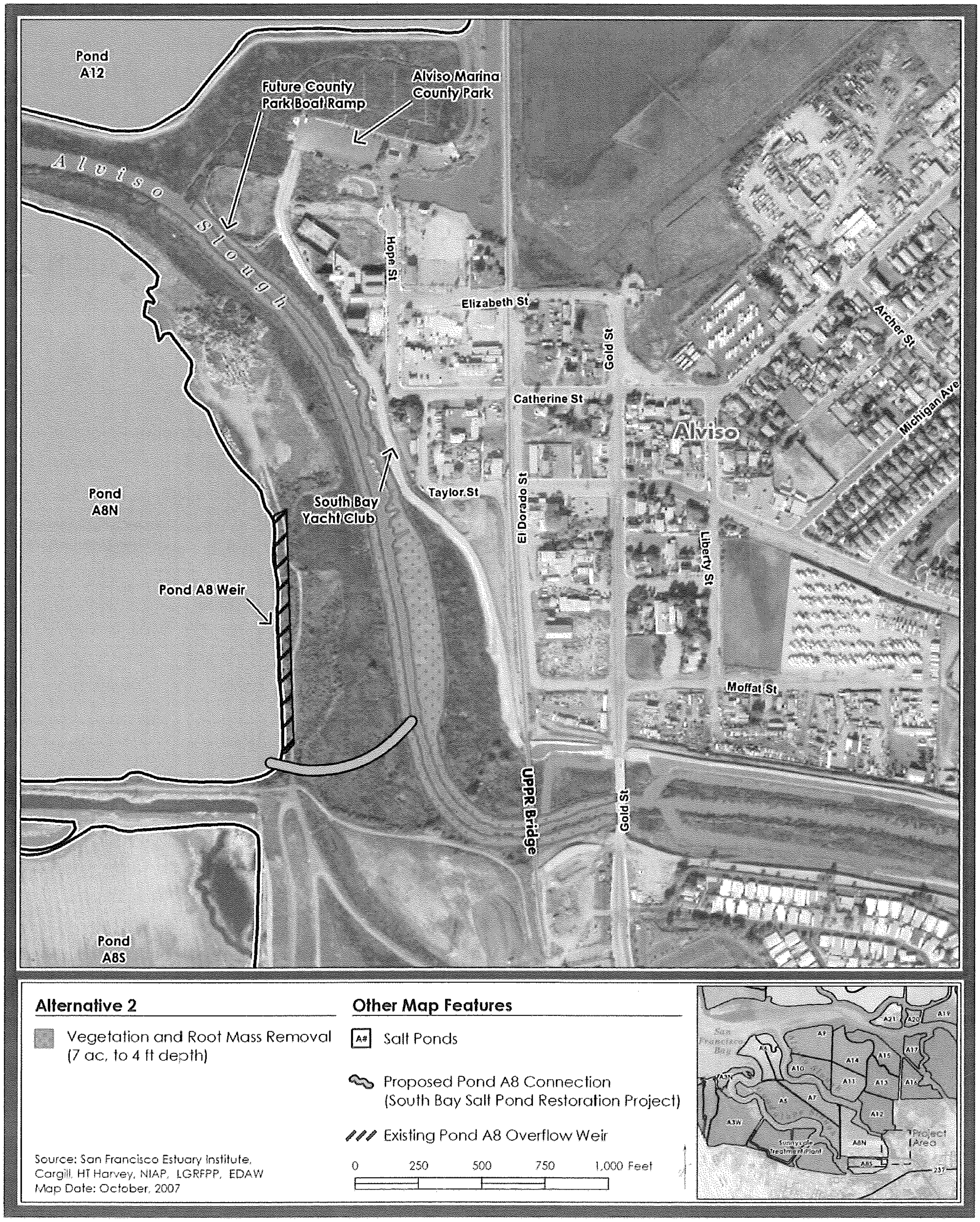
	Alternative					
	Alt. 1	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 5**	**Alt. 6**
Vegetation Removal						
Vegetation Removal, acres	2.6	7.0	3.7	6.2	25	0
Vegetation removed, c.y.	8,320	22,400	11,840	19,840	80,000	0
Construction Duration – Veg. Removal Only (working days)	<10 days	<10 days	<10 days	<10 days	<10 days	0
Haul trips to Disposal Facility – Veg. Only (round trips)	694	1,867	987	1,654	6,667	0
Hauling Duration – Veg. Only (working days, assuming 80 trips per day)	9 Days	24 Days	13 Days	21 Days	84 Days	0
Dredging						
Dredging, acres	0	0	3.7	6.2	9.7	0
Dredging Depth , feet	0	0	8	16	10	0
Sediment Removed (wet), c.y.	0	0	48,000	160,000	157,000	0
Sediment Removed (dry), c.y. (25% "fluff factor")	0	0	60,000	200,000	200,000	
Construction Duration – Dredging Only (working days)	n/a	n/a	42 days (9 weeks)	140 days (28 weeks)	137 days (28 weeks)	0
Haul trips to Disposal Facility (round-trips) – Sediment only	0	0	5,000	16,667	16,667	0
Hauling Duration (working days, assuming 80 trips per day)	n/a	n/a	73 days (15 weeks)	219 days (44 weeks)	219 days (44 weeks)	0
All Alternatives						
Total Estimated Construction Duration (working days)	19	34	83	229	229	0
Total Estimated Construction Duration (months)	1	1	4	11.5 (over 2 - 4 years[7])	11.5 (over 2 - 4 years[7])	0
Staging/Stockpiling Area Required (veg. + sediment), acres	1	2	5	5	9	0

Notes:

1. c.y. = cubic yard.
2. Vegetation removal results in ~3200c.y. per acre
3. Construction duration assumes 0.5 acre per day vegetation removal per Aquamog, and 230c.y. dredged material per Aquamog.
4. Hauling duration assumes an average of 80 round-trips per day (80 for vegetation plus 80 for sediment), 5 days a week, using 12c.y. haul trucks. The hauling during for sediment also assumes that sediment cannot be hauled offsite until it has completed a 10 day drying period.
5. Hauling of vegetation to Zanker Road Landfill will overlap with hauling of sediment to Newby Island Landfill.
6. Staging areas for drying sediment are assumed to be 2 feet high and a maximum of 6 feet high for stockpiling of sediment. Vegetation stockpiling is assumed to be up to 9 feet high initially then less as it dries.
7. Duration of Alternatives 4 and 5 require at minimum 2 years because all vegetation removal + dredging cannot be completed in a single allowable construction window to avoid species breeding seasons, etc., and could take as many as 3 or 4 years.

Alviso Slough Restoration Project

Figure 2-3:
Alternative 2



Source: San Francisco Estuary Institute, Cargill, HT Harvey, NIAP, LGRFPP, EDAW
Map Date: October, 2007

Vegetation and root mass removal over 7 acres would yield approximately 22,400 c.y. of wet plant material. Assuming that vegetation removal would proceed at 0.5 acre per day per Aquamog, in-stream construction of this alternative would require approximately 10 working days. Hauling the material to the Zanker Road Landfill would require an additional five weeks (see Table 2-2).

As described in Section 2.3.3, all action alternatives include the removal of navigational hazards from the Project area if not already resolved by the BCDC, CSLC, the District, and SBYC by the time of commencement of construction of this project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Maintenance

Improvements to navigation in the slough would be short-lived unless the vegetation and root mass removal were performed periodically. Without the SBSP Phase 1 Action at Pond A8, approximately 3 additional rounds of vegetation and root mass removal would be required for each 10-year maintenance cycle.

If the proposed Phase 1 Action at Pond A8 were successful, some maintenance requirements could be reduced. However, tidal scour associated with the proposed SBSP Phase 1 Action at Pond A8 would not likely sustain the necessary amount of vegetation removal, especially if the A8 notch were constrained to a minimal ~~its initial 20-foot wide~~ opening throughout the life of the Phase 1 Action. In this case, it is expected that some ongoing mechanical vegetation removal would be required to sustain the seven acre footprint of vegetation and root mass removal. The areas of vegetation removal upstream of the Pond A8 notch channel to the Gold Street Bridge would not likely be scoured by the increased tidal prism and would require ongoing maintenance with or without the SBSP Phase I Action at Pond A8.

2.4.3 Alternative 3: Vegetation/Root Mass Removal and Dredging (3.7 acres) to an 8-foot Depth

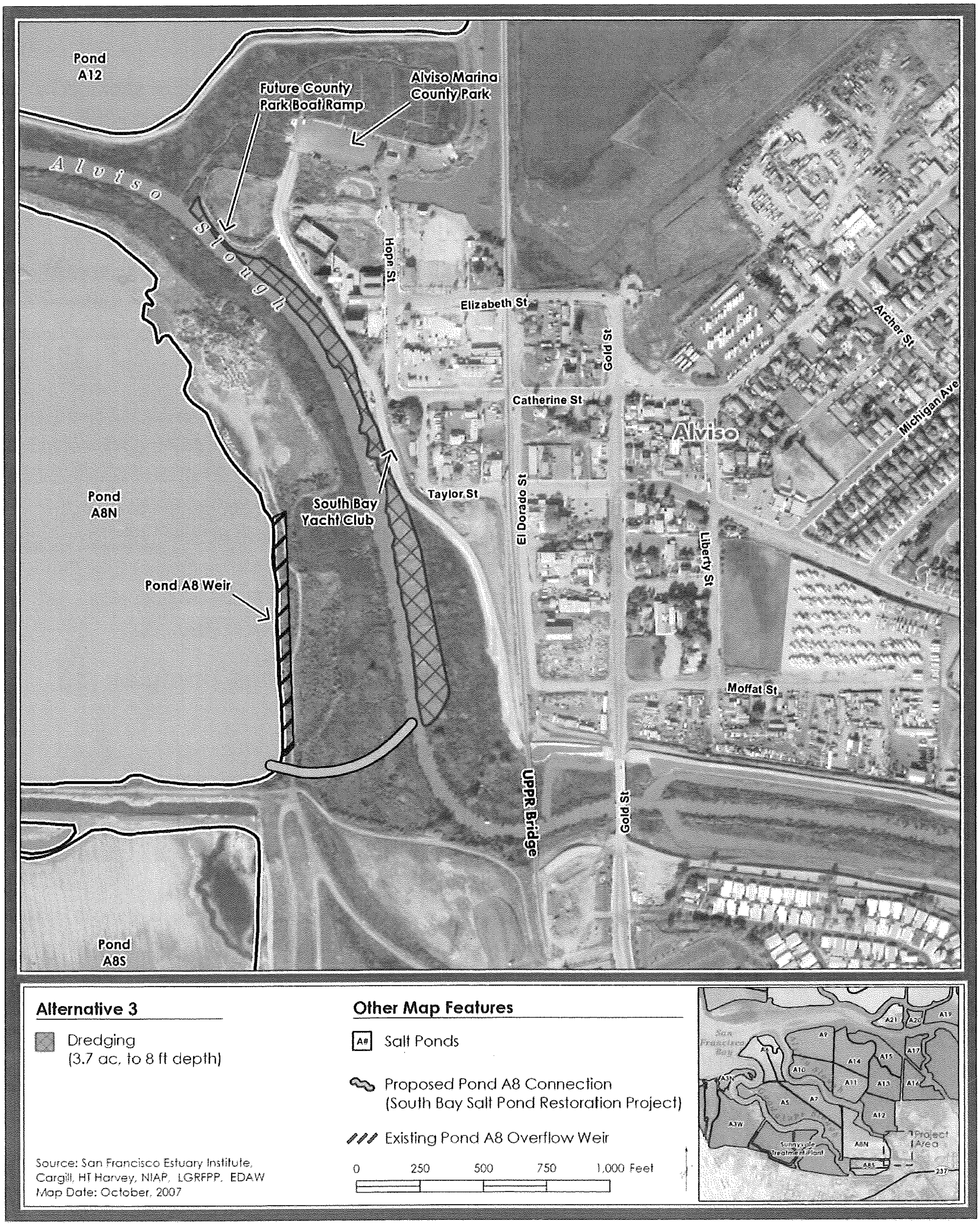
Description

Alternative 3 would entail removing vegetation and root mass along with dredging sediments to a depth of approximately 8 feet below the existing grade over an area of approximately 3.7 acres. The footprint of this alternative would be limited to areas that would most benefit from navigational enhancements in an attempt to balance the extent of environmental impacts and costs while striving to meet the Project objectives. As shown in Figure 2-4, vegetation and root mass removal, and dredging are proposed along the east side of the slough to improve navigation and access for boats. The slough channel would be widened to allow two-way boat traffic, especially in the area between the SBYC and the County Marina, but only at high tide.

Vegetation removal and dredging an area of 3.7 acres to a depth of 8 feet would yield approximately 11,840 c.y. of wet plant material and 48,000 c.y. of wet dredged material. Assuming that vegetation removal would proceed at 0.5 acre per day per Aquamog and that dredging were to proceed at 1,150 c.y. per day (assuming the use of 5 Aquamogs), in-stream activities associated with this alternative would require approximately 9 weeks to complete, all of which would be accomplished in a single construction season (also see Section 2.5.1). Hauling the material to the Zanker Road and Newby Island landfills would require an additional 15 weeks (see Table 2-2).

Alviso Slough Restoration Project

Figure 2-4:
Alternative 3



Source: San Francisco Estuary Institute, Cargill, HT Harvey, NIAP, LGRFPP, EDAW
Map Date: October, 2007

As described in Section 2.3.3, all action alternatives include the removal of navigational hazards from the Project area if not already resolved by the BCDC, CSLC, the District, and SBYC by the time of commencement of construction of this project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal and/or dredging, they would be re-installed after completion of work.

Maintenance

An 8-foot dredging effort performed without the SBSP Phase 1 Action could provide enhanced navigation benefits for a period of up to 3 years. The new water depth would initially be eight feet, but would gradually decrease as sedimentation occurred over time. Without the SBSP Phase 1 Action at Pond A8, this alternative would require additional dredging approximately 3 times for each 10-year maintenance cycle to sustain any improved navigational depth in the slough.

Scouring associated with the proposed SBSP Phase 1 Action at Pond A8, if implemented and successful, would sustain much or all of the width created by dredging under this alternative, but would not maintain all of the added depth. Implementation of the Pond A8 Action might lessen the frequency of dredging required to sustain this dredged depth, but would not eliminate the need for maintenance dredging. Assuming the predicted increase in depth of two feet with the SBSP Phase 1 notch and sedimentation rates of 1 – 2 feet per year (Ruth and Going, 1980), dredging would be required approximately 2 times in each 10-year maintenance cycle to provide continually enhanced navigational 8-foot depth in the slough.

2.4.4 Alternative 4: Vegetation/Root Mass Removal and Dredging (6.2 acres) to a 16-foot Depth

Description

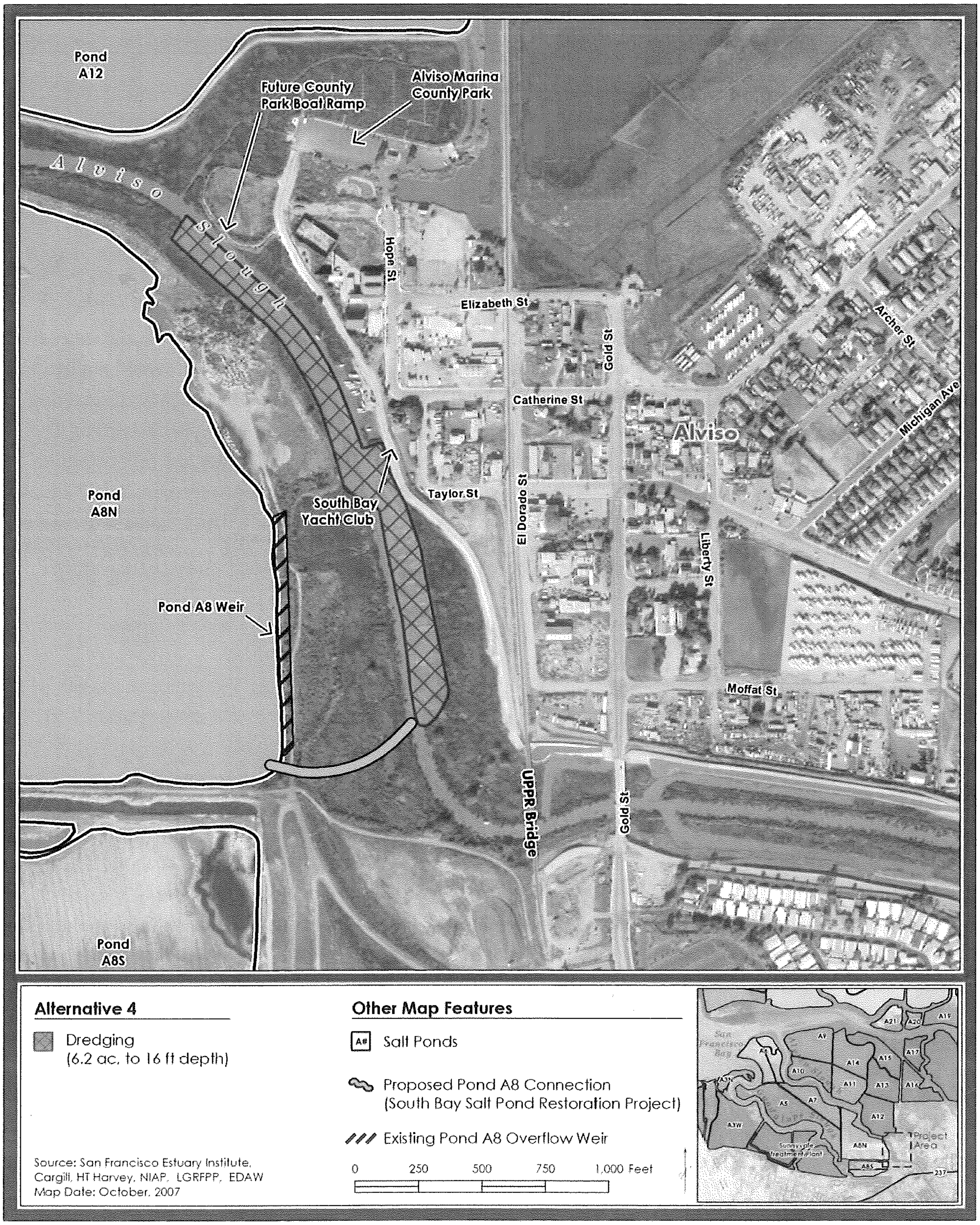
Alternative 4 would involve removing vegetation and root mass and dredging sediments to a depth of approximately 16 feet below the existing grade over an area of approximately 6.2 acres (Figure 2-5). This depth was chosen because it approximates the equilibrium channel depth expected to be realized in Alviso Slough after implementation of full tidal action in Pond A8, which has been proposed as part of the long-term SBSP Restoration Project. Further, the footprint of this alternative is limited to areas that would most benefit from navigational enhancements.

Alternative 4 would provide significant expansion of the width and especially the depth of the slough. While this alternative would not restore the open channel width of the slough to pre-1983 conditions, it would improve navigation and access for boats in the vicinity of the SBYC and the Alviso Marina County Park. Unlike the previous alternatives (1, 2, and 3), two-way boat traffic would be possible between the SBYC and the County Marina even at lower tides, and larger boats could maneuver in the Project area.

The proposed footprint of this Project alternative would encompass the east side of the slough in the vicinity of the SBYC, similar to the previous alternatives; however, downstream of the SBYC, the proposed footprint of Project work would include the west side of the slough. The deepening and widening of the slough was shifted to the west bank under this alternative because the fringe marshes are wider and it is believed that dredging to a depth of 16 feet, if conducted on the east bank of the slough, could compromise the structural integrity of the flood protection levees.

Alviso Slough Restoration Project

Figure 2-5:
Alternative 4



Source: San Francisco Estuary Institute, Cargill, HT Harvey, NIAP, LGRFPP, EDAW
Map Date: October, 2007

Vegetation removal and dredging an area of 6.2 acres to a depth of 16 feet would yield approximately 19,840 c.y. of wet plant material and 160,000 c.y. of wet dredged material. Assuming that vegetation removal would proceed at 0.5 acre per day per Aquamog and that dredging would proceed at 1,150 c.y. per day (assuming the use of 5 Aquamogs), in-stream activities associated with this alternative would require approximately 28 weeks to complete. Two to three construction seasons are expected to be required to remove all of the material from the slough. In this case, vegetation and root mass removal and dredging to a shallower depth (perhaps 8-10 feet) would occur the first year, and then dredging to the desired 16-foot depth would occur the following year. Hauling the material to the disposal locations would take much longer than two construction seasons. Furthermore, depending on the amount of equipment available and able to enter the Project area at any one time, the vegetation removal and dredging actions might be done either concurrently, or one after the other. Hauling the material to the Zanker Road and Newby Island landfills would require an additional 44 weeks, assuming that both vegetation and sediment hauling would be occurring simultaneously (see Table 2-2). Both Alternatives 4 and 5 require ample staging area for sediment drying and stockpiling.

As described in Section 2.3.3, all action alternatives include the removal of navigational hazards from the Project area if not already resolved by the BCDC, CSLC, the District, and SBYC by the time of commencement of construction of this project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal and/or dredging, they would be re-installed after completion of work.

Maintenance

A deep dredging effort performed without the SBSP Phase 1 Action could provide enhanced navigation benefits for a period of up to 10 years, perhaps until such time as a full breach of Pond A8 could be initiated under the long-term SBSP Restoration Project, which is expected to induce additional deepening and widening of the slough through tidal scour. The new water depth would initially be 16 feet, but would gradually decrease as sedimentation occurs over time. Thus, in order to maintain the deeper navigational enhancement sought by this alternative, it is assumed that a one-time dredge to 16-feet would be required for each 10-year maintenance cycle.

A deep dredging effort concurrent with successful implementation of the SBSP Phase 1 Action could help direct the scour into areas that would enhance recreational boating, but a 16-foot dredge depth could not be sustained by the scour from the SBSP Phase 1 Action alone. Based on observed sedimentation rates in the slough, deep dredge of 16 feet below existing grade could delay marsh re-establishment by up to a decade or more.

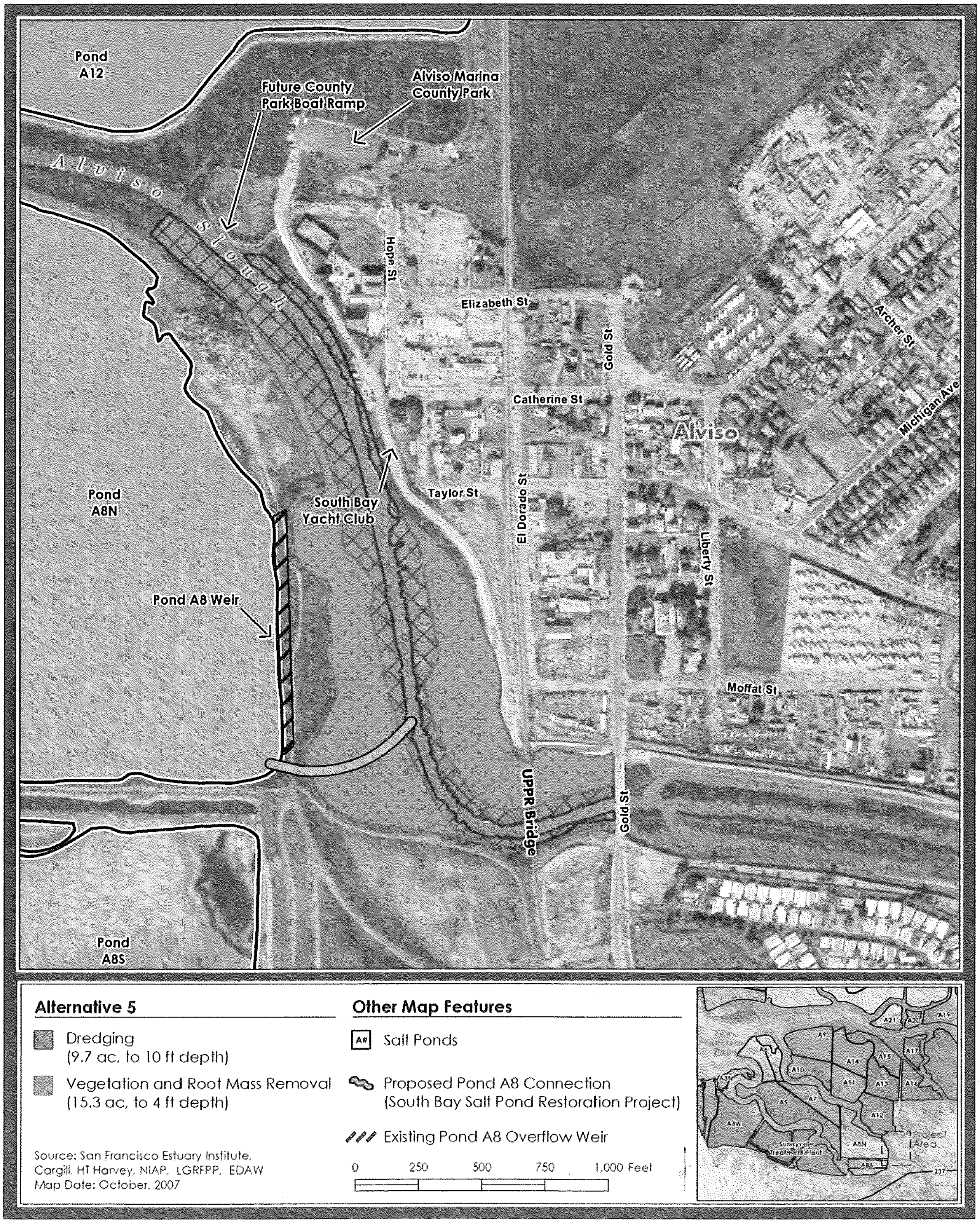
2.4.5 Alternative 5: Vegetation and Root Mass Removal (15.3 acres) to a 4-foot Depth plus Additional Dredging (9.7 acres) to a 10-foot Depth

Description

Unlike Alternatives 1 through 4, vegetation and root mass removal under this alternative would be accomplished through a combination of (1) removing the vegetation and root mass to a maximum depth of 4 feet in some areas and (2) dredging to 10 feet below the existing grade in other areas (Figure 2-6).

Alviso Slough Restoration Project

Figure 2-6:
Alternative 5



Source: San Francisco Estuary Institute, Cargill, HT Harvey, NIAP, LGRFPP, EDAW
Map Date: October, 2007

The actions in Alternative 5 were developed to mimic the slough's depth and open-water channel width in approximately 1983. Under this scenario, the slough channel would be widened and deepened to allow two-way boat traffic between the Gold Street Bridge and the existing Alviso Marina County Park.

Vegetation and root mass removal to 4 feet over 15.3 acres would not significantly alter the depth of the slough in the Project area where vegetation removal were undertaken, as only the root mass and the small amount of sediment attached to the roots would be removed. Vegetation removal (over all 25 acres) would yield approximately 80,000 c.y. of wet plant material. Assuming that vegetation removal would proceed at a rate of 0.5 acres per day per Aquamog, in-stream construction would require approximately 10 days, using five Aquamogs simultaneously.

Dredging to 10 feet over an area of 9.7 acres would yield approximately 157,000 c.y. of wet dredged sediment. Assuming that dredging were to proceed at 1,150 c.y. per day (assuming the use of 5 Aquamogs), this portion of the alternative would require approximately 28 weeks to complete. Hauling the material to the Zanker Road and Newby Island landfills would take an additional 44 weeks, assuming that both vegetation and sediment hauling would be occurring simultaneously (see Table 2-2). Like Alternative 4, two or three construction seasons are expected to be required to remove all of the material from the slough. In the case of 2 years, vegetation and root mass removal, and dredging to a shallower depth (perhaps to 6 or 8 feet) would occur the first year, and then dredging to the desired 10-foot depth would occur the following year. Depending on the amount of equipment available and able to enter the Project area at any one time, the vegetation removal and dredging actions may be done either concurrently, or one after the other. Both Alternatives 4 and 5 require ample staging area for sediment drying and stockpiling.

As described in Section 2.3.3, all action alternatives include the removal of navigational hazards from the Project area if not already resolved by the BCDC, CSLC, the District, and SBYC by the time of commencement of construction of this project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal and/or dredging, they would be re-installed after completion of work.

Maintenance

Without the SBSP Phase 1 Action at Pond A8, approximately 3 additional rounds of vegetation and root mass removal over 15.3 acres would be required for each 10-year maintenance cycle.

Without the SBSP Phase 1 Action at Pond A8, the 10-foot dredging effort could provide enhanced navigation benefits for a period of 3 to 5 years. (Note that the depth of dredging would initially be 10 feet, but the depth would gradually decrease as sedimentation occurs over time.) It is assumed that 2 or 3 additional dredging actions to 10 feet would be required for each 10-year maintenance cycle to maintain the navigational benefit.

Successful implementation of the Phase 1 Action has the potential to sustain a wider channel along Alviso Slough (50 to 90 feet wider at the SBYC). The precise footprint of the SBSP Phase 1 Action scour cannot be predicted, but it is estimated that roughly two to five acres of marsh would be removed along Alviso Slough in the Alviso Slough Restoration Project area. Implementation of the Alviso Slough Project concurrent with the SBSP Phase 1 Action could direct the added scour into areas that would enhance recreational boating, thus helping to maintain some (but not all) of the new channel width proposed under Alternative 5. The areas of vegetation removal upstream of the Pond A8 notch channel to the Gold Street Bridge would not likely be scoured by the increased tidal flows and would require ongoing maintenance with or without the SBSP Phase 1 Action at Pond A8.

A 10-foot dredge depth could not be sustained solely through implementation of the SBSP Phase 1 Action at Pond A-8. Based on observed sedimentation rates of 1–2 feet per year in the now inactive Alviso County Marina, a dredge to 10 feet below the existing grade could delay marsh re-establishment by 4 to 5 years or more. Actual sedimentation rates in areas dredged for the Alviso Slough Restoration Project could differ due to differences in sediment supply and sediment dynamics within the slough, as compared to sediment supply and dynamics at the former marina.

2.4.6 Alternative 6: No Project

Under the No Project Alternative, the District would take no action to widen or deepen Alviso Slough between Gold Street and the Alviso Marina County Park. However, the District would continue to perform monitoring and maintenance activities such as maintaining the flood protection levees and mowing vegetation in the area around Gold Street and the Union Pacific Railroad bridges in accordance with current management direction and existing permits.

If no action were taken by the District and the Phase 1 Action at Pond A8 were not implemented, the existing pattern of channel narrowing would continue, and, in the upper (landward) reach of Alviso Slough, the channel thalweg (the deepest part of the channel) would continue to deepen. The rate of these changes would gradually diminish until the channel reaches an equilibrium depth and width. Navigation would not improve, and effects on vegetation as a result of changes in salinity would continue.

With successful implementation of the SBSP Phase 1 Action over the long term, tidal scour in Alviso Slough would likely increase the current channel width by 50 to 90 feet in the vicinity of the SBYC and would deepen the channel depth. These predicted changes would be self-sustaining as long as the tidal exchange between Pond A8 and Alviso Slough continued. The No Action Alternative combined with a successful SBSP Phase 1 Action would benefit recreation and improve navigation over time, and would not require the District to implement maintenance or mitigation measures, as required by all other alternatives. The No Action Alternative – with or without the Phase 1 Action would not restore the slough to pre-1983 conditions.

Successful implementation of the SBSP Phase 1 Action would increase the possibility of full tidal restoration at Pond A8. Over the long term (perhaps 10 years or more), the larger SBSP Restoration Project would further improve navigation along Alviso Slough, possibly eventually restoring the area to pre-1983 conditions.

2.4.7 Sediment Disposal Options

As described above, concentrations of contaminants like mercury and PCBs will limit options for re-use and disposal of dredged sediment. Sediment testing has not yet been completed on the materials from within the Project area. However, data from just downstream of the Project area was analyzed in conjunction with the U.S. Geological Society (USGS). This data suggests that the material in the slough contains concentrations of contaminants that border on not being suitable for re-use as wetland material.

Specifically, the concentrations of contaminants in the sediment analyzed suggest that it likely cannot be re-used as wetland cover material, but there is some possibility that it can be re-used as wetland foundation material.

Because the material sampled was (1) not directly available from within the Project area, and (2) not sampled to the same depths proposed for this project, it cannot be entirely determined with certainty if Project area material is suitable for re-use as wetland foundation material. Therefore, the alternatives described above assume that disposal at a local landfill would be necessary.

Because clean dredged material is often sought by projects around the bay, this EIR includes preliminary environmental analysis of the disposal option where the dredged material is beneficially re-used in the South Bay, perhaps at the Bair Island Restoration Project or in conjunction with the SBSP Restoration Project. Depending on the quality of the sediment and the uniformity of its properties, it could either be directly transported from the slough to the re-use site, or it may need to be mixed at a staging area in order to homogenize the material. Finally, depending on the re-use location, the material could be either trucked, conveyed (e.g., slurry pipeline) or barged from the Alviso Slough Project area to the re-use site.

2.5 GENERAL CONSTRUCTION, OPERATIONS, AND MAINTENANCE DESCRIPTION FOR ALL ALTERNATIVES

2.5.1 ~~Construction~~ Schedule

The overall Project schedule is expected to be as follows:

- Draft EIR released for Public Review: 2nd Quarter 2008
- Recirculated Section 3.2 released for Public Review: 2nd Quarter 2009
- Final EIR released for Public Review: 4th ~~Quarter 2008~~ 4th Quarter 2009
- Final EIR certification by the District: ~~1st~~ 4th Quarter 2009
- District Board Approval of Project: ~~1st~~ 4th Quarter 2009
- NEPA Federal Document Preparation by USACE: ~~4th~~ 2nd Quarter 2010 ~~2009~~
- Permit acquisition complete: ~~1st~~ 2nd Quarter 2011 ~~2010~~
- Construction start: ~~2010 and 2011~~ 2011- 2013, depending on ~~action~~alternative selected (plus ~~2012~~ maintenance dredging vegetation removal as needed), or as determined by the District Board

Construction progress would be limited by the number of equipment that can be in the slough at any one time; the size, location, and availability of necessary contractor staging areas; and regulated hours and seasons for construction work. Construction equipment and staging areas are described in the following subsection.

Constraints on the Project construction schedule would also include avoidance of the nesting season for migratory birds (generally spring and early summer), the rearing and migration seasons for anadromous fish (spring and winter), and the rainy winter season. The construction window would therefore be assumed to be approximately June 15 to October 15 (or less[2]), but would be determined more specifically by the appropriate regulatory agencies during permitting. Daily construction hours, including all work in the slough and hauling of materials, would be limited to hours permitted by the City of San Jose Noise Ordinance. Estimated time for construction for each alternative is described in Table 2-2.

---

[2] The regulatory agencies may limit the construction window to August – October if the clapper rail is a concern to these agencies, with some possibility to work in the slough in February and March. In this case, vegetation removal could occur in

2.5.2 Construction Sequencing

The District would retain a construction contractor for all vegetation and sediment removal in the slough and transport to disposal sites.

Prior to construction, appropriate measures would be taken to avoid any unnecessary impacts, including implementation of Best Management Practices (BMPs) (see Section 2.5.3) and any pre-construction mitigation measures. Also, depending on specific regulatory agency requirements, any necessary pre-construction biological surveys and/or sediment testing would be completed.

For all alternatives, (except No Project) the vegetation and root mass would be removed first. For Alternatives 3, 4 and 5 only, vegetation and root mass removal would be followed by dredging. Initial consultation with an Aquamog operator indicates a preference for working downstream to upstream. However, the selected construction contractor would determine the exact sequencing of work in the slough, and possibly in conjunction with permit requirements or preferences by regulatory agencies. Depending on the alternative selected, two to five Aquamogs would work in the slough simultaneously (see Table 2-2). The Aquamog would be brought on-site by truck and then float in the channel to break up vegetation and collect debris and silt. It can lift debris to the levee or directly onto a truck. It may also be necessary to place material removed on a barge, then moved to a location where it can be loaded onto trucks.

For vegetation and root mass removal, the Aquamog would first cut the vegetation down to the water surface. Next, the Aquamog would use a rotovator attachment to till and dislodge the submerged vegetation and its root mass. An aquatic weed harvester would collect the vegetation debris for hauling to the Zanker Road Landfill. This process could proceed at approximately 0.5 acre per day per Aquamog. The harvested vegetation may be generated faster than could be disposed. In this case, and especially for Alternatives 3, 4, and 5 where dredging activities would commence immediately after the vegetation removal, a nearby staging area would be required to store the harvested vegetation temporarily until it could be hauled to the Zanker Road Landfill. The material need not be dried to be accepted at the Zanker Road Landfill.

For dredging activities, the Aquamog would use a clamshell bucket attachment to scoop and lift sediment from the slough. The dredged material would be hauled to a nearby staging area for drying for 3 to 10 days. This process would proceed at approximately 230 c.y. of removed sediment per day per Aquamog.

As described in Section 2.3.3, all action alternatives include the removal of navigational hazards from the Project area if not already resolved by the BCDC, CSLC, the District, and SBYC by the time of commencement of construction of this project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal and/or dredging, they would be re-installed after completion of work.

February or March followed by sediment removal in August, September and October. This scenario could extend the construction period from two to three seasons for Alternatives 4 and 5.

2.5.3 General Construction Equipment and Procedures

Construction Equipment and Workers

Heavy equipment would be used for removal of vegetation and dredged material and to move the material from the slough to staging/drying areas, and ultimately to the disposal locations. Construction equipment would include Aquamogs, excavators, dozers, and haul trucks in and around Alviso Slough (see Tables 2-3 and 2-4).

Table 2-3 Typical Construction Equipment Needed

Type of Equipment	Use
Aquamog or alternately hydraulic or suction dredging	Excavate vegetation and/or sediment from slough
Harvester, Excavators	Excavate vegetation and/or sediment from slough, gather rotovated material
Loader/Dozer	Manage material at staging area; aid in loading material on to haul trucks
Conveyor Trailers	Shoreline transfer to haul trucks
Haul Truck, 10-wheel (12 c.y.)	Haul material from construction area to disposal facility
Transfer Barge	Move vegetation and sediment in the slough within Project area
Crane/Pile Driver	Install piers (if needed)

Table 2-4 Expected Construction Equipment Needs

Type of Equipment	Quantity of Typical Equipment Needed					
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Aquamog	2	2	4-5	4-5	4-5	0
Hydraulic dredging	1	1	1	1	1	0
Harvester	2	2	2-3	3-4	4-5	0
Excavator	1	1	2	2	2	0
Loader/Dozer	1	1	2	3	3	0
Conveyor trailer	2	2	2	2	2	0
Dump/Haul Truck	10	10	15-20	15-20	15-20	0
Transfer Barges/Crane	0	0	4	5	5	0
Pile driver	1	1	1	1	1	0

Construction workers would be on-site each business day during the construction period, during the hours of 8 a.m. and 5 p.m. or as allowable by the City of San Jose. Generally, there would be one operator for each piece of equipment in Table 2-2 plus a construction site manager. Workers would find street parking around the SBYC. Biological monitors, regulatory agency personnel, and District staff would be on-site periodically.

Best Management Practices for Construction

The Draft EIR referred to the District's 2006 BMPs Handbook and provided ~~provides~~ a complete list of District BMPs and references. Since this time, the BMP Handbook has been revised. The 2008 revised BMP Handbook has been provided as Appendix II of this Final EIR. Applicable measures are incorporated into the Project design by reference, with the primary purpose being to avoid, prevent, or minimize adverse environmental impacts. The BMPs address impacts relating to:

- Air Quality;
- Biological Resources;
- Cultural Resources;
- Hazards & Hazardous Materials;
- Hydrology/Water Quality;
- Noise;
- Transportation/Traffic; and
- Utilities/Service Systems.

Additional measures to avoid or minimize impacts during construction and maintenance specifically developed for this Project are identified as mitigation and are included in Chapter 5 of this EIR.

Staging Areas

Table 2-5 and Figure 2-7 identify potential sites for handling harvested vegetation and for drying sediments generated from dredging activities. There would be separate staging areas for vegetation and for sediment. As discussed above, the harvested vegetation need not be dried prior to hauling to the Zanker Road Landfill. However, a staging area would be used to store the harvested material temporarily so as to allow dredging activities to commence in the slough immediately following vegetation removal (for Alternatives 3, 4, and 5) while the harvested vegetation is hauled to the disposal facility.

The dredged sediment would be hauled to the Newby Island Landfill for disposal. This facility requires the material to be dry or nearly dry, which requires that one or more staging areas be used to dry the material once removed from the slough. Two to four acres, depending on Alternative, would be needed to accommodate truck traffic and the maneuvering of equipment to spread, till, place, and transfer material. The dredged sediment would be spread into approximately 2-foot layer for drying at one or more staging areas before being trucked to Newby Island Landfill. EPA Method 9095 must be used to evaluate the drying limit for acceptance by the Newby Island Landfill (assumed to be 5-10 days).

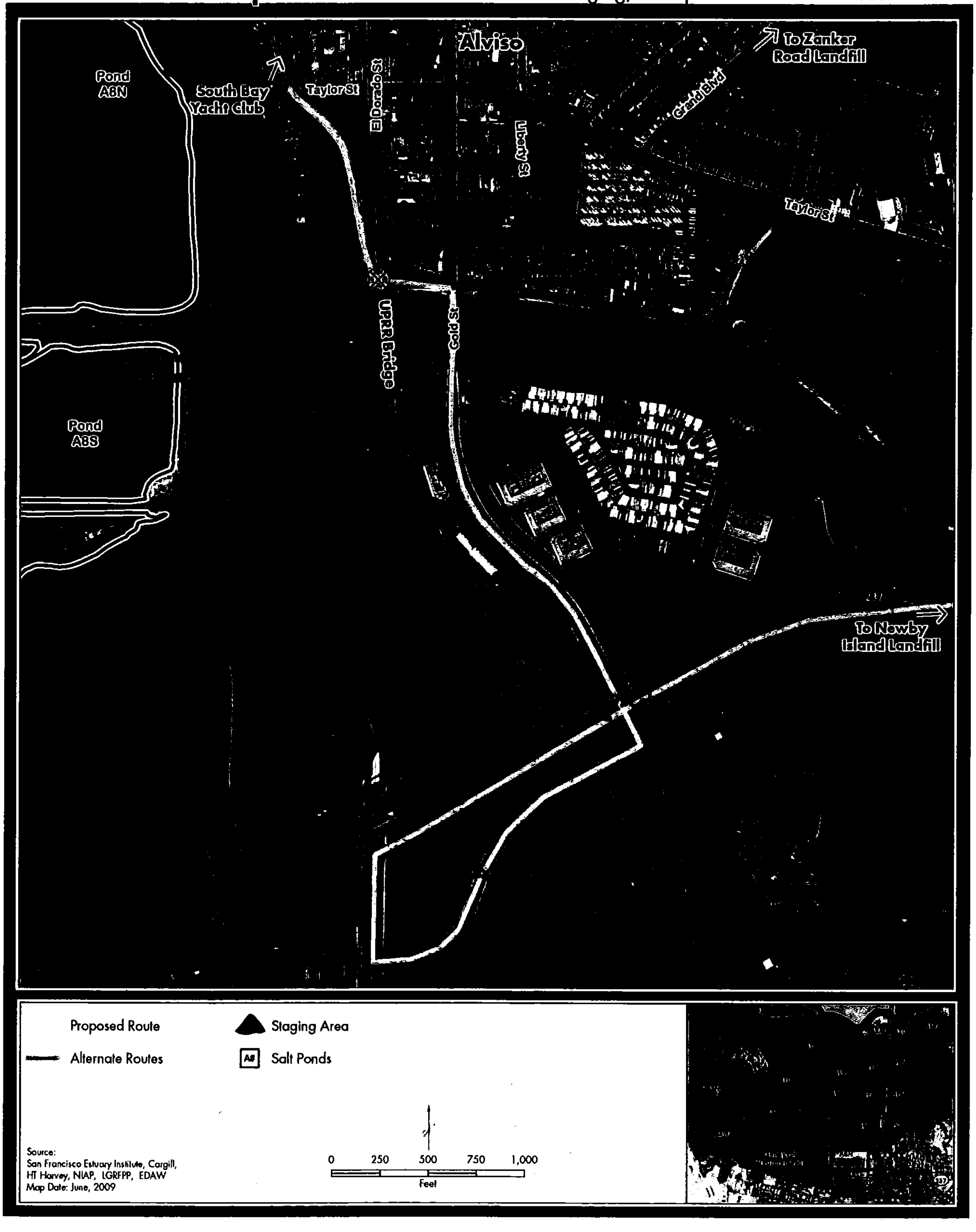
Table 2-5 identifies the staging sites from Figure 2-7, in conjunction with ownership (if known), acreage, and notations on possible benefits or complications.

Table 2-5 Potential Staging Areas

Site Number (see Figure 2-7)	Owner or street description	Acreage (est.)	Notes
1	SCVWD ~~Cargill Inc.~~	5+ ~~0.65~~ acres	Site is best for sediments generated on western portion of site. ~~Impact to Cargill operations is unknown, as activities have been observed at the site.~~ Site ~~does not~~ meets minimum space need. ~~, and would dictate the use of another site in combination.~~
2	Pellegrini and SCVWD	0.57 acres	Site is conducive for eastern portion of site, but terrain may need some advance earthwork to create level surface. Site does not meet minimum space criteria.
3 and 4	3 – unknown site owner 4 – Sainte Claire Corp.	1.4 acres	Sites 3 and 4 are evaluated together, as potential closure of Moffat St. between the site could make the location conducive for storing sediment. Businesses and residents in the immediate vicinity of Gold St. might be affected by increased noise and potential odors. Site does not meet minimum space criteria.
5 (Alternative Site – Low Probability for Approval)	Pond A8S – State of California	> 2 acres	If material can be staged to this area for anticipated reuse within the site for the SBSP Restoration Project, then this might be the most economical site. However, depending on the type of reuse planned, sediments from the Project area would need to meet Regional Water Quality Control Board criteria for wetland foundation and cover. Access within the interior of the site might be difficult, thus placement should be made along perimeter provided this would be conducive for future reuse and distribution at site.
6	Yerba Buena Way – North	0.77 acres	Site is suitable for development, thus cost and availability might limit the site as an option. Site does not meet minimum size limit.
7	Santa Clara Golf and Tennis Club	2.2 acres	Site appears to be part of golf course and may be reserved for expansion of the course. Golf course may have need for sediment to improve upon facilities. Coordination with owner is warranted.
8	Lafayette St./Yerba Buena Way – SW Corner	0.2 acres	Site does not meet minimum size limit. Very flat and partial paved with drainage infrastructure, thus conducive for drying.
9	Caltrans, State of California	0.46 acres	Site has bridge shadow that might decrease drying. Bridge columns might impede movement of material. Site does not meet minimum size limit.
~~10~~	~~Potentially owned by Caltrans, as likely excess land parcel~~.	~~0.4 acres~~	~~Site does not meet minimum size limit. Site is adjacent to small pond that could be future restoration or wetland mitigation site. Site may have limited development opportunity and could be potential candidate site for final placement of materials~~.

Alviso Slough Restoration Project

Figure 2-7:
Staging/Stockpile Areas and Local Haul Routes



Source:
San Francisco Estuary Institute, Cargill,
HT Harvey, NIAP, LGRFPP, EDAW
Map Date: June, 2009

Hauling to Disposal Areas

Vegetation Disposal - Zanker Road Landfill

Vegetation would be transported by truck approximately three miles to the Zanker Road Landfill located on Los Esteros Road (see Figure 2-7). Approximately 80 round trip truck trips between the staging area and the landfill would occur each day.

Sediment Disposal - Newby Island Landfill

Dredged sediment would go to Newby Island Landfill located on 1601 Dixon Landing Rd. in Milpitas, about seven miles from the Project site (see Figure 2-8). Approximately 80 round trip truck trips between the staging area and the landfill would occur each day.

At times, both the vegetation hauling and the sediment hauling would occur concurrently (for Alternatives 3, 4, and 5 only). Ideally, the staging areas for vegetation and for sediment would be separated to avoid doubling of trucks on the same roads for this overlap period.

Sediment Disposal – Beneficial Re-use Options

Disposal options for the dredged sediment include barging or trucking the material to a nearby restoration site, or using a conveyor system (e.g., slurry pipeline) to move the sediment from Alviso Slough to a nearby location where the sediment could be re-used.

The re-use options require (1) additional information about the quality of the dredged sediment (contaminants, structural properties), and (2) identification of a suitable re-use site that is desirable both in terms of location and project timing.

2.5.4 Maintenance

The descriptions of the alternatives above indicate the approximate frequency of primary actions needed to sustain the Project benefits. Other regular maintenance would include drive-by inspections. No in-the-water construction activities are planned as part of regular maintenance.

2.5.5 Monitoring

Pre-construction biological surveys would commence before any ground disturbing activities take place. During construction, the District would employ construction monitors to ensure proper implementation of BMPs, mitigation measures, and permit conditions required by this EIR and the permitting agencies.

2.6 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA requires that each EIR identify the "environmentally superior alternative" among all of those considered. If the No Project Alternative is identified as environmentally superior, then the EIR also must identify the environmentally superior alternative among the other alternatives (CEQA Guidelines Section 15126 (e)(2). The goal of identifying the environmentally superior alternative is to assist decision makers in considering project approval. CEQA does not, however, require an agency to select the environmentally superior alternative.

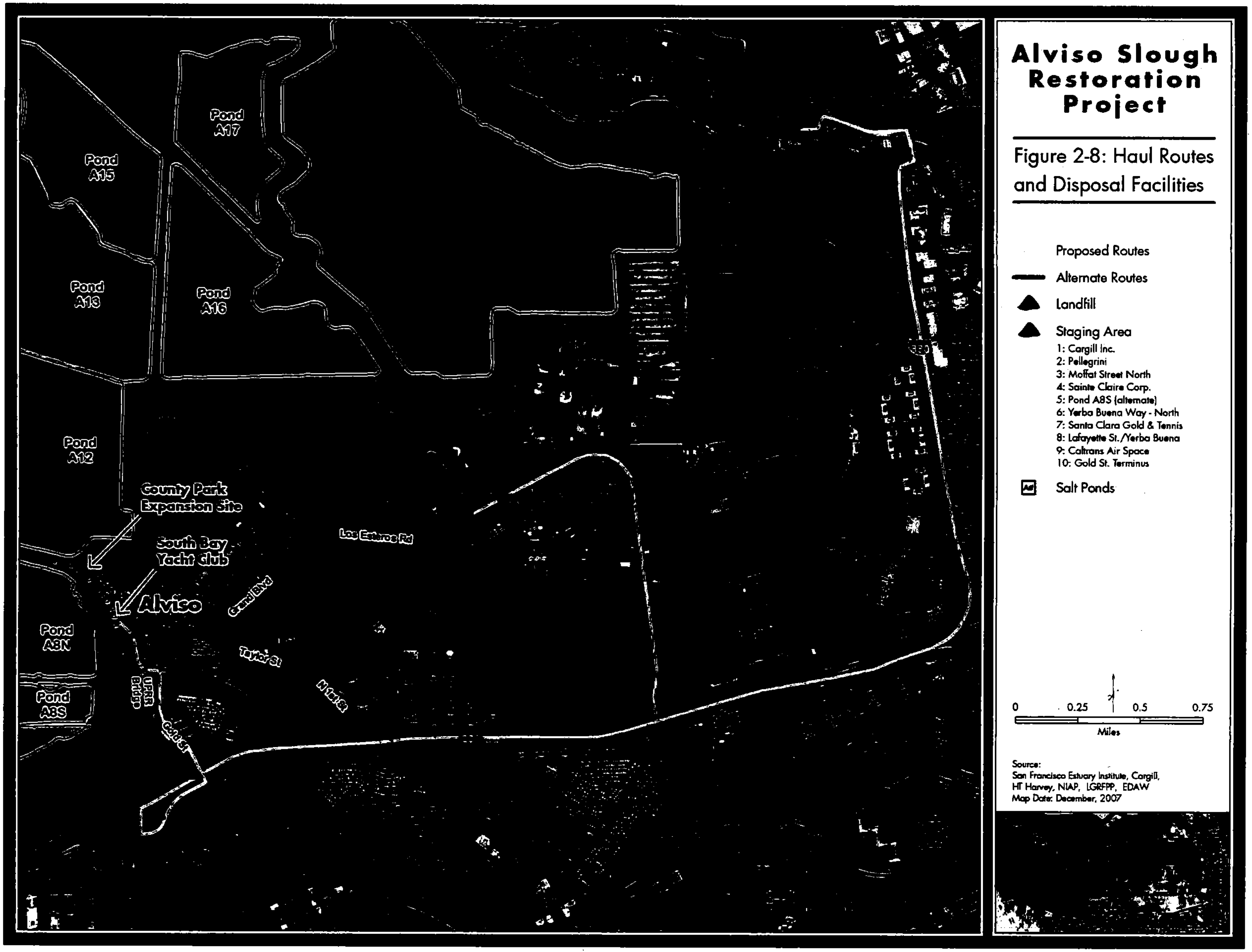
The No Project Alternative (Alternative 6) would avoid all project related adverse impacts, but would also forego the desired benefits to Alviso Slough. Therefore, of the action alternatives (Alternatives 1 through 5), the District considers the CEQA Environmentally Superior Alternative to be Alternative 1. Alternative 1 limits the Project footprint to 2.6 acres in the area that would most benefit from the vegetation removal - the area around the SBYC docks. Removal of 2.6 acres of vegetation minimizes direct impacts to wetland vegetation, minimizes the need for extensive truck trips to the disposal facility, and minimizes the need for large staging/stockpiling areas for sediment drying. Most importantly, perhaps, is that the footprint of Alternative 1 is within the estimated two to five acres that would scour over the next 10 years as a result of a successful SBSP Restoration Project Phase 1 Action. This, in effect, would reduce or could even eliminate the need for ongoing maintenance by the Alviso Slough Restoration Project in this area. Alternative 1 does not, however, meet all of the Project objectives.

2.7 STAFF-RECOMMENDED ALTERNATIVE

This project's planning study was initiated and carried out through a collaborative process agreed to by the District and the Alviso Water Task Force. Evaluation of the five action alternatives was performed by applying two categories of criteria: community-based criteria and technical criteria. Due to the collaborative approach for this project, the community-based criteria and the technical criteria were each given a 50 percent weight in the alternatives' evaluation process.

The community-based criteria address 1) to what extent an alternative meets the project objectives; and 2) the community's preference among the feasible alternatives. The technical criteria address project cost-effectiveness, project sustainability, and environmental impacts.

Each of the five action alternatives was assigned a ranking of 1 to 5 for each criterion or sub-criterion, with 5 fully meeting a criterion, and 1 not meeting the criterion. Based on this approach, Alternative 5 achieved the highest score, and was identified as the Staff-Recommended Alternative in the Draft EIR (May 2008). ~~and has been identified as the Staff Recommended Alternative. Alternative 1, the least costly, most easily sustained in the longer term, and having the least environmental impact of the action alternatives, ranked a close second.~~ After review of comments on the Draft EIR, and the volume of concerns about cost-effectiveness, project sustainability and environmental impacts, District staff has changed its Staff-Recommended Alternative to Alternative 3. Alternative 3 is less costly than Alternative 5 and has fewer potential environmental impacts due to the reduced area of vegetation and root mass removal and dredging (3.7 acres versus 15.3 acres) and a lesser depth of dredging (3.7 acres dredged to 8 feet versus 9.7 acres dredged to 10 feet).



Alviso Slough Restoration Project

Figure 2-8: Haul Routes and Disposal Facilities

Source:
San Francisco Estuary Institute, Cargill, HT Harvey, NIAP, LGRFPP, EDAW
Map Date: December, 2007

This page intentionally left blank.

3 Environmental Setting, Impacts, and Mitigation Measures

The impacts analysis in this ~~Draft~~ Final EIR evaluates 5 action alternatives and the required No Project alternative. The action alternatives include vegetation removal and/or dredging and removal of navigational hazards, as described in Chapter 2. Under the No Project alternative, the District would not take any action in the Project area and existing programs would continue. The analysis covers impacts from the construction and maintenance phases – both in the slough and at staging areas – over the Project's initial 10-year timeframe.

To help distinguish the magnitude of impacts under each alternative, each impact is classified as follows:

- **Class I** (significant, cannot be mitigated to a level that is less than significant);
- **Class II** (significant, can be mitigated to a level that is less than significant);
- **Class III** (less than significant); or
- **Class IV** (beneficial).

In some cases, no impact would be generated; these items are identified as **No Impact**.

CEQA states that "an EIR shall describe feasible measures which could minimize significant adverse impacts" (CEQA Guidelines Section 15126.4[a][1]). Mitigation measures do not include standard Best Management Practices (BMPs), which are assumed to be included in the Project design. Mitigation measures are presented immediately following the associated impact; in some cases the measures are cross referenced between topics in Chapter 3.

Significant impacts that cannot be mitigated to less-than-significant levels are considered unavoidable.

This page intentionally left blank.

3.1 HYDROLOGY AND GEOMORPHOLOGY (HYD)

This section discusses the regulatory setting, physical setting, and environmental impacts assessment related to hydrology and geomorphology aspects of the Alviso Slough Restoration Project.

3.1.1 Regulatory Setting

The Alviso Slough Restoration Project falls under the jurisdiction of numerous federal, state, and local agencies with respect to specific aspects of planning, restoration and management (see Table 3.1-1 below). The following section summarizes the primary laws and regulations affecting flood management, hydrodynamics and sediment transport within the area.

Table 3.1-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
FEDERAL	
United States Environmental Protection Agency *Federal Clean Water Act*	Section 404 of the Clean Water Act (CWA) regulates all activities resulting in the discharge of dredged or fill material into waters of the United States, which includes wetlands. Section 404 modifies the general authority of the U.S. Environmental Protection Agency (EPA) to regulate water quality through the restriction of pollution discharges. In such, the U.S. Army Corps of Engineers (USACE) is given the principal authority to regulate discharges of dredged or fill material, under oversight by the EPA. While the USACE is given authority to issue permits allowing such discharges, the EPA is given the authority to veto permit decisions.
USACE *Rivers & Harbors Act.*	The Rivers and Harbors Act (RHA) of 1899 prohibits the unauthorized alteration or obstruction of any navigable waters of the United States. As defined by the RHA, navigable waters include all waters that are: o historically, presently, or potentially used for interstate or foreign commerce; and o subject to the ebb and flow of tides. Regulations implementing Section 10 of the RHA are coordinated with regulations implementing CWA Section 404. The RHA specifically regulates: o construction of structures in, under, or over navigable waters; o deposition or excavation of material in navigable waters; and o all work affecting the location, condition, course, or capacity of navigable waters. The RHA is administered by the USACE. If a proposed activity falls under the authority of RHA Section 10 and CWA Section 404, the USACE processes and issues a single permit. For activities regulated only under RHA Section 10, such as installation of a structure not requiring fill, permit conditions may be added to protect water quality during construction.
San Francisco BCDC *Coastal Zone Management Act*	The Coastal Zone Management Act (CZMA) of 1972 requires that federal actions be consistent with state coastal plans. The San Francisco Bay Conservation and Development Commission (BCDC) Bay Plan is approved under the CZMA. To implement this provision, federal agencies make "consistency determinations" on their proposed activities and applicants for federal permits, licenses, other authorization or federal financial assistance make "consistency certifications". The BCDC then has the opportunity to review the consistency determinations and certifications and to either concur with them or object to them.

Agency + Plan or Policy	Overview & Applicability
FEMA *National Flood Insurance Acts*	The National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 were enacted to reduce the need for flood protection structures and to limit disaster relief costs by restricting development on floodplains. FEMA was created in 1979 to administer the NFIP and to develop standards for fluvial and coastal floodplain delineation.
STATE	
San Francisco Bay Conservation and Development Commission *McAteer-Petris Act*	The McAteer-Petris Act of 1965 established BCDC as a temporary state agency in charge of preparing the Bay Plan. In 1969, the Act was amended to make BCDC a permanent agency and to incorporate the policies of the Bay Plan into state law. Under the McAteer-Petris Act and the Bay Plan, any agency or individual proposing to place fill in, to extract materials from, or to substantially change the use of any water, land or structure in BCDC's jurisdiction is required to secure a San Francisco Bay Permit. BCDC grants San Francisco Bay permits for projects that meet either of the following guidelines: o The project is necessary to the safety, welfare, or health of the public in the entire Bay Area. o The project is consistent with the provisions of the implementing regulations and the Bay Plan. The types of San Francisco Bay permits include region-wide, administrative, and major permits. The type of permit issued depends on the nature and scope of the proposed activities.
State of California *California Water Code*	The California Water Code ensures that the water resources of the state are put to beneficial use to the fullest extent of which they are capable and that the conservation of water is exercised in the interest of the people and for public welfare. All projects in California must abide by Division 5 of the State of California Water Code, which sets the provisions for flood control. The code includes a number of provisions that pertain to local and state flood management, and flood protection. Section 8100 et. seq. of the code contains guidelines for the construction of public works and improvements including: the protection and restoration of watersheds, levees or check dams to prevent overflow or flooding, conservation of the floodwaters, and the effects of construction projects on adjacent counties (especially upstream and downstream along a river). Section 12840 et. seq. of the code contains provisions related to flood prevention projects.
California Department of Fish and Game *California Fish and Game Code Sections 1600-16016.*	In accordance with Sections 1601-1607 of the California Fish and Game Code, the California Department of Fish and Game (CDFG) regulates projects that affect the channel, flow, or banks of rivers, lakes, or streams. Sections 1602 and 1603 require public agencies and private individuals to notify and enter into a streambed or lake alteration agreement with CDFG before beginning construction that would: o change, divert, or obstruct the natural flow or the bed, bank, or channel of any river, lake, or stream; o use materials from a streambed; or o result in the deposition or disposal of debris, waste, or other material containing flaked, crumbled, or ground pavement where it can pass into any river, lake, or stream. Lake or streambed alteration agreements may impose conditions to protect water quality during construction. Sections 1600-1616 may apply to any work undertaken within the 100-year floodplain of a body of water or its tributaries, including intermittent stream channels. In general, they are construed as applying to work within the active

Agency + Plan or Policy	Overview & Applicability
	floodplain and/or associated riparian habitat of a stream, wash, or lake that provides benefit to wildlife and fish. Sections 1600-1616 typically do not apply to drainages that lack a defined bed and banks, such as swales, or to very small bodies of water and wetlands.
LOCAL	
Santa Clara Valley Water District *Santa Clara Valley Water District Act.*	The Santa Clara Valley Water District is the CEQA Lead Agency for the proposed project. The Santa Clara Valley Water District (District) Act of 1951 established the District, giving it the authority to implement the following District purposes identified by the District Act: o to protect Santa Clara County from flood and storm water; o to provide comprehensive conservation and management of flood, storm and recycled waters for all beneficial uses; o to increase and prevent the waste of the water supply in the District; and o to enhance, protect and restore stream, riparian corridors, and natural resources in connection with other purposes of water supply and flood protection. Under the Water Resources Protection Ordinance (Ordinance 06-1, formerly Ordinance 83-2), the District requires encroachment permits for all construction activities along or within a watercourse (including levees) where the District owns easements or property. Activities requiring a permit include grading adjacent to the watercourse, along the levees, or within the channel and/or any activity resulting in modifications to the drainage, discharge or conveyance of the watercourse. Permits, if granted, may require mitigation for any disturbance to the health of the watercourse.

3.1.2 Physical Setting

Alviso Slough is a component of a dynamic evolving estuarine system. The San Francisco Bay estuary evolves as its smaller geomorphic constituents respond to changing environmental conditions, such as long-term sediment supply and relative sea level rise. Deep subtidal channels, shallow subtidal bays, intertidal mudflats, and tidal salt marsh that form on the estuarine margin are all components of the estuary that interact and evolve with each other in response to physical processes. The form of the estuary at any given time is the current expression of the interaction and evolution of hydrodynamic and geomorphic processes within the estuary.

Alviso Slough is a relatively small geomorphic constituent of the San Francisco Bay. The channel was historically formed to drain a large area of tidal marsh to the far South San Francisco Bay (South Bay). Its upstream extent was situated close to the original Alviso dock on the Guadalupe River, where water-based commerce thrived beginning in the 1840s. In the 1850s, the locals excavated a connecting channel between the Guadalupe River and this slough so as to obtain a shorter access route to and from the South Bay. The slough and connecting channel became known as Steamboat Slough. For the next 50 to 60 years, the Guadalupe River would bifurcate when it reached what is now the location of the SBYC. Part of its flow continued down Steamboat Slough, and the remainder wound its way via Guadalupe Slough.

Construction of salt pond levees in the 1940s severed the Guadalupe River from its natural course along Guadalupe Slough, and the river flowed to the Bay only via Steamboat Slough, which eventually became known as Alviso Slough. Severing the connection between the river and its floodplain, as well as diking along Alviso Slough to create the salt pond complex, altered the hydrodynamics driving the slough's equilibrium by reducing its tidal prism and increasing freshwater flows. Ground subsidence due to over-pumping of the groundwater basin and urban development in the upper watershed through the remainder of the 20th century have also affected the present morphology of the slough, which continues to adjust to changes in its hydrodynamics.

A conceptual model of the evolution of Alviso Slough is described further in the Conceptual Model Memorandum by PWA (2007).

Regional

Hydrodynamics and Sediment Dynamics

The South Bay is geomorphically a self-contained system where the sediments therein have been derived mainly from local watersheds (Watson 2004). Its sediment supply might also be supplemented by infrequent large winter flood events on the Sacramento River that can intrude sediment laden water into the South Bay. Sediments are mobilized and transported via complex hydrodynamics, which are driven by the mix of freshwater tributary inflows, tidal currents and winds at any given time.

Tides. Walters and others (1985) provide a detailed description of tidal processes in the South San Francisco Bay. In general, the tides propagate through the Golden Gate as shallow water waves, and the amplitudes and phases of the waves are modified by the bathymetry, reflections from the shores, and bottom friction. Tides in the far South Bay exhibit a standing wave behavior, where the wave is reflected back upon itself, resulting in tidal amplification.

The tides in the San Francisco Bay are mixed semidiurnal, with two high and two low tides of unequal heights each day. The tides exhibit strong spring-neap variability, with the spring tides (larger tidal range) occurring approximately every two weeks during the full and new moon. Neap tides (smaller tidal range) occur approximately every two weeks during the moon's quarter phases. The tides also vary on an annual cycle, in which the strongest spring tides occur in late-Spring/early-Summer and late-Fall/early-Winter, and the weakest neap tides occur in Spring and Fall.

Climate and Precipitation. The San Francisco Bay Area, like much of California's central coast, experiences a Mediterranean climate characterized by mild, wet winters and dry warm summers. Air temperatures are mild due to proximity to the ocean and are seldom below freezing. Winter weather is dominated by storms from the northern Pacific Ocean that produce nearly all the annual rainfall, while summer weather is dominated by sea breezes caused by differential heating between the hot interior valleys and the cooler coast. The prevailing wind direction over the South Bay is typically from the west to northwest in the late spring, summer and early fall with more variable conditions in the winter (Cheng and Gartner 1985).

The South Bay typically receives about 90 percent of its precipitation in the fall and winter months (October – April); with the greatest average rainfall occurring in January. The average annual rainfall in the counties surrounding the South Bay is approximately 20 inches, although the actual rainfall can be highly variable due to El Niño (wet) and La Niña (dry) years and the influence of local topography.

Salinity. Salinity in the South Bay is governed by salinity in the Central Bay, exchange between the South and Central Bays, freshwater tributary inflows to the South Bay, and evaporation. In general, the South Bay is vertically well mixed (i.e., there is little tidally-averaged vertical salinity variation) with near oceanic salinities due to low summer and fall freshwater inputs to the far South Bay.

Seasonal variations in salinity are driven primarily by variability in freshwater inflows (Life Science 2003). In winter and early spring in wet years when fresh water from the San Francisco Bay Delta intrudes into the South Bay (Figure 11 in the SBSP Hydrodynamics and Sediment Dynamics Existing Conditions Report) (PWA, H. T. Harvey & Associates et al. 2005), salinity conditions are often dynamic, characterized by unsteady flows, variable salinity and periodic vertical stratification (Life Science 2003). As Delta and tributary inflows decrease in late spring, salinity increases to near oceanic salinities. The largest source of fresh water to the South Bay during summer comes from the local municipal wastewater treatment plants.

Wind Waves. The majority of waves within the South Bay are generated locally by wind, as opposed to swells generated by weather systems far offshore that spread into the Estuary. The wind direction over the South Bay is typically from the west and northwest in late spring, summer and early fall, with more variable conditions in winter (Cheng and Gartner 1985). The wind-wave climate of the South Bay has not been extensively studied, although wind-waves in the broad South Bay shoals are recognized as a mechanism for sediment resuspension. URS (2002) analyzed wind conditions between 1992 and 1998 and found that the average wind speeds were 3.8 m/s in the winter, 5.2 m/s in the spring, 6.0 m/s in the summer and 4.2 m/s in the fall with peak winds occurring in the afternoon.

Sediment Transport. Suspended solids concentration (SSC) in the South Bay exhibits highly dynamic short-term variability, primarily in response to sediment input from tributaries and sloughs, and tidally-driven and wind-driven resuspension (Cloern, Powell et al. 1989; Powell, Cloern et al. 1989; Schoellhamer 1996). A review of the historical data shows that SSCs are typically higher near the bed than at mid-depth and decrease with northward distance from the far South Bay (PWA, H. T. Harvey & Associates et al. 2005). SSCs are temporally variable on tidal as well as seasonal scales. SSCs exhibit strong diurnal and spring-neap variability, with the highest SSCs occurring on spring tides. On a seasonal time scale, SSCs are higher in the summer months when average wind speeds and wind-wave action are greatest. Greater wind-wave action increases resuspension and re-working of the sediment deposited during the previous winter months. Wind is the most dynamic factor affecting temporal and spatial variability in SSC (May, Koseff et al. 2003). In general, increases in fetch and wind speed will result in larger wind-waves, and in the South Bay's broad shoals, these wind-waves resuspend sediments creating more turbid conditions.

Sediment Budget. A sediment budget is essentially an accounting of all sediment delivery, export, and storage. For the South Bay, this includes mostly waterborne sediments in tributary inflows, outflows to the Central Bay, dredging and deposition within open water areas, existing marshes and restored ponds. Foxgrover and others (2004) suggest that the South Bay between San Mateo Bridge and Dumbarton Bridge, has undergone net erosion from 1956 to 1983, rather than deposition as presented in Krone (1996). The historic erosion and deposition patterns within this region of the South Bay are currently a topic of scientific research and debate. Estimates of total fluvial sediment inputs to the Bay (Ogden Beeman & Associates and Ray B. Krone & Associates 1992; Krone 1996; McKee, Ganju et al. 2002) have decreased over time due to reservoir construction and watershed recovery from 19th century land use changes in the Central Valley (McKee, Ganju et al. 2002; Wright and Schoellhamer 2004). A far greater volume of sediment is continually resuspended into the water column and subsequently reworked and redistributed internally (Krone 1996).

Both studies agree that the far South Bay south of the Dumbarton Bridge has remained a net depositional environment. Furthermore, measured sedimentation rates are generally higher in the far South Bay than in other parts of the bay. Measured sedimentation data were reviewed from the Palo Alto Yacht Harbor (PWA 1987), Steven's Creek Marsh restoration (Brown and Caldwell, PWA et al. 2005), Alviso Marina (Ruth and Going Inc., Cooper-Clark Associates et al. 1980), Warm Springs Marsh restoration (PWA and Phyllis Faber & Associates 2003) and Triangle Marsh (Watson 2004). Higher rates of sedimentation have been measured in the far South Bay due to high levels of SSCs and its low-energy environment. Measured sedimentation rates vary depending on the elevation of the site relative to the tidal range. Those sites lower in the tide frame (generally developing marshes) will tend to accrete sediment at a faster rate than those sites that are higher in the tide frame (fully developed marshes).

Flood Hazards

Coastal Flood Hazards. Much of the low lying margins of the South Bay are within the 100-year coastal floodplain. However, flooding solely from coastal sources has been rare due to the de facto flood protection that the existing salt pond levees provide. Coastal flooding in South San Francisco Bay can occur due to the combination of effects from both high Bay water levels and wind waves. High Bay water levels in concert with wind waves can lead to erosion and/or overtopping of coastal barriers. High Bay water levels result from a superposition of high astronomical tides, storm surge and climatic conditions (i.e., El Nino). The highest astronomic tides occur for a few days each summer and winter due to the relative positions of the earth, moon and sun. The highest Bay water levels typically occur in the winter when storm surges are coincident with the higher astronomic tides. Storm surge is an increase in water level caused by atmospheric effects including low barometric pressure and strong winds over shallow areas which combine to push water against the shoreline.

FEMA and the USACE have developed maps that show predicted 100-year floodplain; however, their delineations differ based on their respective definitions of the measure of flood protection provided by existing infrastructure. FEMA delineation of the coastal floodplain in the South Bay is based on the conservative assumption that the salt pond levees provide for a reduction of wave action but do not prevent inundation from high Bay water levels. Therefore, the coastal floodplain subject to the National Flood Insurance Program (NFIP) is based on a projection of the 100-year Base Flood Elevation (BFE) onto the surrounding landscape. The USACE considers both a "worst case" scenario and a "most likely" condition in defining the 100-year coastal floodplain in the South Bay. The "worst-case" scenario was based on complete failure of the existing salt pond levees, which would allow Bay waters to inundate broad areas inland of the ponds. The "most likely" condition evaluated the probability of waves generated by winds of various speeds, durations and directions occurring simultaneously with extreme Bay water levels. The "most likely" condition evaluated the 10-, 50-, 100-, and 500-year forcing events for which wave runup and overtopping were predicted.

FEMA is currently pursuing flood re-mapping projects of the north and central portions of San Francisco Bay coastal flood hazards, and may pursue a similar study of the South Bay in the future. The published information is therefore based on analysis accomplished about 20 years ago and the elevations will likely increase when the new studies are accomplished.

Fluvial Flood Hazards. Fluvial flooding has been the primary source of historical flood damages around the developed margins of the Bay. Fluvial discharges result when rainfall runoff is carried to the Bay via natural or constructed channels. In the South Bay, an extensive network of levees has been constructed along various reaches of these channels to protect adjacent developed areas from the overtopping of fluvial discharges. Although these levees separate the channel from its natural floodplain, and constrict flows to an unnaturally narrow corridor, these leveed reaches are designed to convey large fluvial discharges during high Bay tide. During large rainstorms, high runoff flows constricted by the channel levees result in higher water surface elevations and potential overtopping of the levees when coincident high Bay tides and extreme runoff conditions exceed the design capacity of the leveed channel. Overtopping can result in the inundation of the adjacent areas. Out-of-bank flooding has occurred in areas adjacent to non-leveed channels when the runoff exceeds the carrying capacity of the channel. Flooding also results when local drainage water ponds on the landward side of the levees before discharging to the Bay (either by pumps of gravity flow).

The capacity of many streams and flood channels has been gradually reduced by the deposition of sediment constricting its channels and reducing the cross-sectional area. Sediment may be derived either from the landward side (watersheds) or from the Bay. One common problem is deposition in the fluvial channels throughout the salt ponds. Under natural conditions, the channels experienced daily tidal scouring flows from the adjacent marsh lands. Where these areas were diked off to create salt ponds, the scouring flows were eliminated and sedimentation has decreased channel conveyance. This reduced flow capacity causes floodwater to back up, raising water surfaces and increasing flood hazards upstream. To maintain capacity in Santa Clara County streams, reaches upstream of the salt ponds are typically maintained by sediment removal activities.

Levees and Infrastructure. The levees along the margins of the South Bay have been typically constructed with Bay mud (weak clays and silts) dredged from adjacent borrow ditches or pond areas. During levee construction, the soils were not compacted and presently continue to settle and deform. In general, levees are low to moderate in height and have fairly flat, stable slopes. Some dikes were constructed from imported soil, riprap, broken concrete and other predominantly inorganic debris, and therefore typically have steeper slopes than the levees constructed of Bay mud.

Levee construction methods, levee materials and subsurface conditions are further detailed in reports by Tudor Engineering Company (Tudor Engineering Company 1973), the USACE (U.S. Army Corps of Engineers 1988), and Moffatt & Nichol Engineers.

The existing levees provide a measure of flood protection (U.S. Army Corps of Engineers 1988). The existing salt ponds act as temporary storage during coastal flooding conditions. As the ponds fill, waves may overtop internal levees in a sequence, causing erosion and reducing flood protection capabilities. If tidal action is introduced to the salt ponds, either through restoration or passively through deterioration of the levees, the effectiveness of the salt pond complexes as flood protection mechanisms would be substantially reduced. The flood protection benefit of the salt pond levees is dependent on regular maintenance.

Project Area

Hydrodynamics and Sediment Dynamics

Alviso Slough is a hydrodynamically complex system, with freshwater inflows and tidal currents interacting to shape the channel. Both the fluvial and tidal processes have been modified by various changes to the watershed and former tidal marshes over the last century.

Tributary Inflows. Alviso Slough connects the Lower Guadalupe River to the Bay. The Guadalupe River watershed encompasses approximately 190 mi^2 (500 km^2) in which there are five main tributaries: Los Gatos Creek, Ross Creek, Guadalupe Creek, Alamitos Creek and Canaos Creek. Average annual rainfall varies from 14-16 inches in lower, urbanized regions of the watershed to 28-44 inches in the higher, mountainous regions (McKee, Leatherbarrow et al. 2004). There are four main reservoirs in the watershed, the last of which was built in 1952. Hydrologic conditions cited here are therefore averaged for the period following dam installation.

Annual runoff for the water year 1971 to 2000 period varied from 3 to 282 cubic feet per second (cfs), with a daily average of 61.8 cfs (McKee, Leatherbarrow et al. 2004). The majority of runoff occurs between November and April (91 percent of runoff occurred between November and April between 1971 and 2000). Discharges of 2,800 cfs occur on average every 2 years, while those of 8,000 cfs and 18,350 cfs occur every 10 and 100 years, respectively. Floods have been recorded on the Guadalupe River, the largest of which was in 1995, when an instantaneous discharge of 11,000 cfs was recorded.

Water Level Fluctuations in Response to Bay Tides. Tidal influence along Alviso Slough extends approximately 7.5 miles from San Francisco Bay upstream to Montague Expressway (Schaaf & Wheeler 2004). Channel constriction and bottom friction modify the amplitude and phase of the tidal wave as it propagates along the slough.

Tidal datums are available from the National Oceanographic and Atmospheric Administration's National Ocean Service Center for Operational Oceanographic Products and Services (NOAA NOS CO-OPS, http://140.90.121.76/) at two locations in Alviso Slough: Coyote Creek at the mouth of Alviso Slough and Gold Street Bridge (Table 3.1-2). The NOAA tidal datums are based on tide measurements made from 1984 to 1985 (Coyote Creek) and 1976 (Gold Street Bridge) and are adjusted by NOAA for the current National Tidal Datum Epoch (1983 to 2001) by comparing tide measurements (using a harmonic analysis) to a nearby reference tide station (Alameda).

In 2004, tide level data were collected as part of the initial planning phase of the South Bay Salt Ponds (SBSP) Restoration Project. These recent data indicate that the tide range in Alviso Slough near Gold Street Bridge has decreased over time. These changes are presumably due to changes in channel form (i.e., shoaling and narrowing) over the past 20 years which may have modified how the tides propagate along the slough. The NOAA tidal datums at Gold Street Bridge may not reflect these changes.

Table 3.1-2 NOAA NOS Tidal Datums in Feet (Adjusted), North American Vertical Datum of 1988 (NAVD).[1]

Tide	Coyote Creek, Alviso Slough[2]	Gold Street Bridge, Alviso Slough[3]
Mean Higher High Water	7.48	7.31
Mean High Water	6.90	6.74
Mean Tide Level	3.31	2.93
Mean Sea Level	3.40	3.01
Mean Low Water	-0.28	-0.88
NAVD88	0.00	0.00
Mean Lower Low Water	-1.52	-1.97

[1]. Conversion from published datums in mean lower low water (MLLW) to NAVD88 from NOAA (unpublished data)

[2]. NOAA Station #9414575, based on tide measurements from April 1984 - March 1985

[3]. NOAA Station #9414551, based on tide measurements from January 1976 - March 1976

Modeling studies (PWA 2007, Schaaf & Wheeler 2004) have been performed to evaluate potential changes to Alviso Slough tidal and salinity dynamics that may result from the Pond A8 Phase 1 Action. These modeling efforts also provide information on existing tidal prism and water levels.

Sediment Dynamics. River mouths and sloughs are naturally depositional areas, with the rate of sedimentation dependent upon sediment supply in the water column and local hydrodynamics. Sediment dynamics within Alviso Slough are very complex but can be examined through a variety of existing data including: a) measured sedimentation rates; b) measurements of SSCs; and, c) interpretations of physical characteristics.

In general, longitudinal profiles of the deepest point in the channel (channel thalweg) reveal substantial morphologic change of Alviso Slough over the past 150 years, particularly after diking of the historic tidal marshes. Sedimentation data are available from the Alviso Marina County Park and cross-section surveys of Alviso Slough. The Alviso Marina County Park was periodically dredged to maintain navigable depths up until 1980. Sedimentation rates measured in the Alviso Marina County Park range from 1.4 – 2.7 ft/year (Ruth and Going Inc., Cooper-Clark Associates et al. 1980). Comparison of cross-sections of Alviso Slough collected in 1996 and 2004 shows that sedimentation is occurring along the channel banks and fringing marshplain, narrowing the channel and steepening the channel bank slopes (PWA 2007).

Estimates of suspended sediment loads vary from 72,563 to 91,044 tons per year, depending on the methods used to obtain them (McKee, Leatherbarrow et al. 2004). As in other climatically variable Bay Area watersheds, suspended sediment loads in Lower Guadalupe River vary considerably over time depending on discharges. USGS data collected during water year 2003 at the USGS stream gage Guadalupe River above U.S. 101 at San Jose (11169025) showed instantaneous suspended sediment concentrations ranging from 5 to 1,180 mg/L. The data for that year showed that 50 percent of the total suspended sediment load occurred in just 1.2 percent of the time, while 90 percent was transported in just 5.8 percent of the time. Samples analyzed for grain size during the same water year showed that suspended sediment loads consist predominantly of sediments of diameter <0.062 mm (>90 percent) and almost all are < 1 mm (McKee, Leatherbarrow et al. 2004).

The Lower Guadalupe River is channelized from the Bay to I-880, and there is an abrupt decrease in slope upon entering Alviso Slough. Grain sizes of sediments along the channel bed and bank decrease downstream. In Alviso Slough sediments are predominantly of tidal origin and are therefore fine to very fine-grained.

Flood Hazards

In the lower reaches, the Guadalupe River enters the Bay via Alviso Slough. Tidal influence extends about 7.5 miles from the Bay upstream to Montague Expressway (Santa Clara Valley Water District 2001) The combination of low channel slope, low flow velocity conditions and availability of Bay sediments creates a depositional environment which has continually decreased conveyance in the channel and increased flood hazards over the years.

Coastal Flood Hazards. The 1988 Shoreline Study (U.S. Army Corps of Engineers 1988) determined that tidal flooding is a significant hazard in Alviso and its surrounding areas due to the potential for overtopping of the outboard salt pond levees near Alviso Slough and lower Coyote Creek (downstream of Artesian Slough). Historical coastal flooding in the area has been limited by the existence of salt pond levees. During the January and December events in 1983, which included the highest tides of record, flooding occurred in northern Santa Clara County and the Alviso area. However, the relative importance of the high tides verses fluvial flows in causing the floods was not determined, as it is not known whether the peak tides during these events coincided with the peak discharges (U.S. Army Corps of Engineers 1988).

For the 100-year event, the 1988 Shoreline Study estimated that Alviso could incur up to six feet of flooding and that most of the flooding would be limited to the area north of SR 237. Based on projecting the 100-year stillwater elevations for Alviso, the potential floodplain extended well inland of the Alviso Slough Restoration Project area.

Fluvial Flood Hazards. The Lower Guadalupe River reach receives runoff from a highly urbanized region comprising a steep upper watershed, an urban residential and light commercial zone (the Upper Guadalupe River), and a developed downtown commercial zone. Stormwater drainage from these areas and from stormwater pumps draining the community of Alviso adds to the runoff volume of the Lower Guadalupe River. Historically, many floods occurred along the Guadalupe River, which resulted in construction of major flood protection projects consisting of channel modifications, bank stabilization and new levees. The recent Lower Guadalupe River Flood Protection Project (LGRP) is designed to provide 100-year flood protection along the lower river system. Inadequate internal drainage backing up in zones of low elevation remains a local problem.

As part of the LGRP, the District has constructed a series of floodwalls and levees along the river banks, replaced the SR 237 eastbound bridge, modified 19 storm drain outfalls, improved and constructed maintenance roads and undercrossings, improved the west perimeter levee around Alviso, and constructed grade-control weirs (gradual drops in the stream elevation). the District reconfigured the existing left bank levee (looking downstream) to act as a weir, allowing high flows in the Guadalupe River to exit Alviso Slough and enter Pond A8. The estimated design discharge for Alviso Slough at the UPRR Bridge at the community of Alviso is 18,350 cfs, which includes the USACE derived peak discharge of 17,000 cfs (Northwest Hydraulic Consultants 2002) and contributions from fourteen interior drainage facilities (pumps and gravity outfalls), which add another 1,350 cfs. The left bank was reconfigured to include an engineered overflow weir to Pond A8 as a means of decreasing peak discharges and water surface elevations downstream of the UPRR. The Pond A8 weir is currently estimated to divert approximately 10,000 cfs of the 100-year flow in Alviso Slough to Pond A8 (SCVWD 2007). Flood waters will be held in Pond A8 and then pumped out (or conveyed via culverts with flap gates) over a period of time (about one month). Large floods that exceed the storage capacity of Pond A8 will top the internal pond levees and convey flood flows into Ponds A5, A6 and A7. Ponds A5, A7, A8N and A8S collectively have a storage capacity of 11,600 ac-ft (PWA 2006).

Also as part of the LGRP, in-stream wetland vegetation is removed in the vicinity of the District's overflow weir to maintain flood conveyance. Removal takes place every year or two using a boom mounted mower attached to a tractor that drives along the low maintenance road adjacent to the slough.

Levees and Infrastructure. Levees border the entire length of Alviso Slough in the Alviso Slough Restoration Project area. The levees were originally built to isolate the salt evaporation ponds from tidal exchange with the slough but have been improved to provide enhanced levels of flood protection for adjacent development. The levees on the east bank of Alviso Slough in the Project Area meet FEMA standards in providing 100-year flood protection.

The average elevations of the levees along Alviso Slough adjacent to each pond are summarized in Table 3.1-3 relative to NAVD88. Internal levees separate individual salt ponds; however, the levees separating the ponds from Alviso Slough have been constructed at much higher elevations than internal levees in order to prevent overflows from the slough and to protect from high tides.

Table 3.1-3 Average Elevations of the Levees Along Alviso Slough

Pond Adjacent to Representative Length of Levee	Average Elevation (ft NAVD88)
Pond A8	12.3
Pond A7	13.1
Pond A12	12.5
Pond A11	12.5
Pond A10	12.1

3.1.3 Environmental Impacts and Mitigation

Overview

This section describes environmental impacts and mitigation measures related to hydrology, flood management, and infrastructure. It includes a discussion of the criteria used to determine the significance of impacts. Because conditions are expected to change after Project implementation in response to natural processes (deposition, scour and vegetation colonization), potential impacts were characterized by evaluating post-construction (at the design conditions immediately after construction), maintenance period, and long-term effects.

Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, significant impact on hydrology or flooding would occur if the Project would:

- Alter existing drainage patterns in a manner which would result in substantial erosion on- or off-site;
- Increase the risk of flooding that could cause substantial property loss, injury, or death;
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems; or
- Place structures within the 100-year flood hazard area that would impede or redirect flood flows.

Impacts & Mitigation

The impacts analysis in this ~~Draft~~ Final EIR evaluates five action alternatives and the required No Project alternative. The action alternatives include vegetation removal and/or dredging, as described in Chapter 2. Under the No Project alternative, the District would not take any action in the Project area and existing programs would continue. The analysis covers impacts from the construction and maintenance phases–both in the slough and at staging areas.

All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by BCDC, CSLC, the District, or SBYC by the time of commencement of construction of this Project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Section 3.1.4 addresses impacts from the Alviso Slough Restoration Project assuming that the South Bay Salt Pond Restoration Project Phase 1 Action at Pond A8 (see Chapter 1) has been implemented and is successful.

Table 3.1-4 lists each impact identified for the proposed alternatives, along with the significance of each impact. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (less than significant and does not require mitigation), or Class IV (beneficial). Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections.

The Proposed project would take place entirely within a reach of Alviso Slough and would not result in the construction or placement of structures within a 100-year flood hazard area. The proposed project would not result in increased impermeable surfaces or result in runoff water that would exceed the capacity of existing stormwater drainage systems. Therefore, these criteria are not discussed further.

Table 3.1-4 Impact and Mitigation Summary

Impact	Without SBSP Phase 1 Action		With SBSP Phase 1 Action	
	Impact Significance	Mitigation Measures*	Impact Significance	Mitigation Measures*
Impact HYD-1: Increased fluvial flood risk (post-construction).	Alts. 1-5: Class II	HYD-A	Alts. 1-5: Class II	HYD-F
	Alt. 6: No Impact	--	Alt. 6: No Impact	--
Impact HYD-1: Increased fluvial flood risk (maintenance period).	Alts. 1-5: Class II	HYB-B HYD-C	Alts. 1-5: Class II	HYD-F
	Alt. 6: No Impact	--	Alt. 6: No Impact	--
Impact HYD-1: Increased fluvial flood risk (long term).	Alts. 1-5: Class II	HYB-B HYD-C	Alts. 1-5: Class II	HYD-F
	Alt. 6: No Impact	--	Alt. 6: No Impact	--
Impact HYD-2: Increased levee erosion along downstream channel banks.	Alts. 1-4: Class III	--	Alts. 1-5: Class II	HYD-G
	Alt. 5: Class II	HYD-D		
	Alt. 6: No Impact	--	Alt. 6: No Impact	--
Impact HYD-3: Increased levee erosion within the Project area.	Alts. 1-5: Class II	HYD-E	Alts. 1-5: Class II	HYD-E
	Alt. 6: No Impact	--	Alt. 6: No Impact	--
Impact HYD-4: Increased coastal flood risk.	Alts. 1-5: Class III	--	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--	Alt. 6: No Impact	--

Note: * The mitigation measures identified for the "Without SBSP Phase 1 Action" would also apply to the "With SBSP Phase 1 Action."

Impact HYD-1: Increased fluvial flood risk.

Alternatives 1, 2, 3, 4, and 5

Post-construction. Hydraulic modeling of Alviso Slough indicates that Alternatives 1 through 5 of the Alviso Slough Restoration Project have the potential to affect flood flows in Alviso Slough downstream of the County Marina. The Lower Guadalupe River Flood Protection Project (LGRP), completed in December 2004, included the installation of a weir along Pond A8. ~~overflow of the Pond A8 weir, part of the LGRP.~~ This~~The existing~~ weir ~~at Pond A8~~ is located within the same reach of Alviso Slough as the proposed Project. During extreme flow events, the weir allows a portion of Alviso Slough flows to overflow to the Pond A5-A6-A7-A8 complex. The ponds provide temporary storage to the diverted flows, and would be drained after the high flows in the slough decrease. ~~The Pond A8 weir is designed to divert a portion of the 100 year flow in Alviso Slough to Pond A8 (and Ponds A5, A7, A6, and Guadalupe Slough), thereby decreasing~~ The ability to divert a portion of high flows from Alviso Slough decreases the peak discharges and water surface elevations downstream of the Alviso County Marina ~~UPRR~~. Hydrologic/hydraulic analyses performed by the District indicate that during the 100-year flow event, the peak flow at the UPRR Bridge is approximately 18,300 cfs. Under existing conditions (based on the 2005 slough configuration downstream of the Union Pacific Railroad (UPRR) Bridge and the existing elevation of the Pond A8 weir), approximately 10,000 cfs~~, or 55 percent~~ of the peak flow~~,~~ would be diverted over the weir to Pond A8, and 8,300 cfs~~, or 45 percent~~ of the peak flow~~,~~ would be conveyed downstream through the slough to the Bay (Appendix IV) ~~(SCVWD 2007)~~.

Alternatives 1 through 5 would lower water surface elevations in the Project area and at the Pond A8 weir during fluvial flood events (Appendix IV) ~~(SCVWD 2007)~~. Lower water levels would occur due to less resistance from vegetation in the channel between Gold Street and the County Marina, and an increase in cross-sectional area of the slough due to dredging of sediments in this reach. Lower water levels would decrease the portion of ~~the 100-year~~ high flows diverted to Pond A8 over the existing Pond A8 weir, thereby increasing the portion of the flow that is conveyed downstream in Alviso Slough, and increasing downstream water surface elevations relative to the baseline conditions. Higher downstream water surface elevations could overtop levee low points on the east side of the slough downstream of the County Marina and increase the threat of flooding to Alviso via New Chicago Marsh. Increased peak discharge, water levels, and velocities during flood events would also increase the risk of levee erosion downstream of the Project area, especially in areas of narrow or negligible fringing marsh.

These post-construction impacts are considered **Less Than Significant with Mitigation** after implementation of the following mitigation measure.

- **Mitigation Measure HYD-A: Lower Pond A8 weir.** The District shall lower the Pond A8 weir to maintain the 2005 hydraulic baseline ~~existing~~ flow split between the Pond A8 weir and Alviso Slough, thereby maintaining 2005 hydraulic baseline ~~existing~~ flows and levels of flood protection downstream of the site during flood events. As described in Appendix IV, ~~T~~ the District ~~(2007)~~ performed hydraulic modeling for each alternative to estimate the extent to which the Pond A8 weir would need to be lowered to maintain the flow split estimated for the 2005 hydraulic baseline ~~existing~~ conditions. Model results indicate that the existing weir at Pond A8 would need to be lowered to the dimensions listed in Table 3.1-5 to maintain the existing flow split for Alternatives 1 through 5.

Potential terrestrial and aquatic biology impacts associated with lowering the Pond A8 weir are assessed in Sections 3.3 and 3.4, respectively. Furthermore, potential hazardous materials, air quality, and noise impacts are assessed in Sections 3.7, 3.8, and 3.9, respectively.

Table 3.1-5 Lowered Pond A8 Weir Dimensions Proposed for Alternatives 1 through 5

Project Alternative	Extent of Pond A8 Weir Lowering (all elevations in NAVD88)	Length of Weir Modification (ft)
1	1.3 ft (to el. 11.4 ft)	200
2	1.4 ft (to el. 11.4 ft)	350
3	1.3 ft (to el. 11.4 ft)	200
4 ~~Option A~~ ~~Option B~~	0.7 ft (to el. 10.7 ft) 1.4 ft (to el. 11.4 ft)	630 370
5 ~~Option A~~ ~~Option B~~	0.5 ft (to el. 10.9 ft) 1.4 ft (to el. 11.4 ft)	630 370

Maintenance period. After construction of any of the alternatives, sediment is expected to deposit and vegetation to reestablish in the Alviso Slough Restoration Project area. The dredged areas would be allowed to fill in with sediment up to maintenance limits specified in the Maintenance Program (EDAW, PWA et al. 2008). Once site elevations reach the maintenance limits, maintenance actions would be performed to remove sediment and return site grades to the design elevations. The vegetation removal areas would be maintained to be largely clear of vegetation. The maintenance actions would be performed at intervals during 10-year maintenance cycles.

Sedimentation, and possibly vegetation re-establishment, between maintenance intervals would increase water surface elevations during flood events relative to mitigated (HYD-A) post-construction water surface elevations. The portion of the 100-year flow diverted to Pond A8 over the lowered Pond A8 weir would increase relative to the post-construction flow split, sending more flow into Ponds A5, A6, A7, and A8, and from Pond A5 into Guadalupe Slough via low spots in the Pond A5 levee. Guadalupe Slough conveys flows from Sunnyvale East Channel, Sunnyvale West Channel, Calabazas Creek, and San Tomas Aquino Creek to San Francisco Bay. Increased overflow to Guadalupe Slough has the potential to increase water surface elevations in that channel. However, this overflow is not expected to significantly increase peak water levels in Guadalupe Slough because of differences in the timing of peak flows on Alviso Slough and Guadalupe Slough (SCVWD 2007). Increased flow over the Pond A5 levee to Guadalupe Slough could also cause increased levee scour and erosion of the Pond A5 levee. The ponds and levees, including the Pond A5 levee, are owned and maintained by the United States Fish and Wildlife Service (USFWS), as part of the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge).

The District's long-term monitoring and maintenance practices for the LGRP are conducted to minimize flooding impacts associated with ongoing sedimentation and vegetation colonization in Alviso Slough (SCVWD and USACE 2006). District staff performs cross-section surveys for Alviso Slough between the Bay and Gold Street every five years. The resulting information is used to update the hydraulic models for Alviso Slough for continuing flood management of the Lower Guadalupe River area. As the slough characteristics change over time, the District may modify the extent of vegetation removal practices in Alviso Slough and coordinate with USFWS to maintain former salt pond levees (K. Oven, SCVWD, pers. comm.).

The Alviso Slough Restoration Project provides for vegetation and sediment removal within the Project area at regular intervals to maintain conditions within maintenance limits that meet the Project objectives. The potential effect of sediment deposition and vegetation reestablishment within the maintenance limits on flood protection provided by the LGRP has not been quantified.

These impacts are considered **Less Than Significant with Mitigation** after implementation of mitigation measure HYD-B, below.

- **Mitigation Measure HYD-B: Modify maintenance limits to reduce potential increase in fluvial flood risk.** The potential for the Project (and its maintenance limits) to increase fluvial flood risk (including Guadalupe Slough) shall be evaluated by the District through hydraulic modeling during the design phase in coordination with LGRP monitoring and modeling described above). If model results indicate an unacceptable increase in fluvial flood risk, the Project maintenance limits would be modified to maintain conditions more similar to post-project conditions (i.e., less sedimentation allowed and more frequent maintenance). These maintenance limits shall be established and maintained by the District to maintain flood protection in accordance with the LGRP.

Long-term. In the long-term, the maintenance period may be extended beyond the initial 10-year maintenance cycle and Project impacts and mitigation measures identified above for the maintenance period would apply. Alternatively, the District could cease to maintain the Project and the Project area could fill with sediment and return to a condition similar to existing conditions. In the latter long-term scenario, sedimentation and increased site elevations and roughness due to vegetation would increase water surface elevations during flood events, thereby increasing flow over the Pond A8 weir (lowered as per mitigation measure HYD-A) relative to the existing flow split. Outside of the Project area, Alviso Slough may also accumulate sediment, thereby contributing to increased water surface elevations and flows over the Pond A8 weir. An increase in the flow over the Pond A8 weir would increase overflow from Pond A5 to Guadalupe Slough.

These impacts are considered **Less Than Significant with Mitigation** after implementation of mitigation measures. If maintenance is continued in the long term, then mitigation measure HYD-B applies. If Project maintenance is ceased in the long-term, then the following mitigation measure (HYD-C) applies.

- **Mitigation Measure HYD-C: Implement measures to maintain flood protection if Project maintenance is ceased.** If Project maintenance is ceased in the long-term, the fluvial flood impacts of allowing the Project area to silt back in and re-vegetate would be evaluated through hydraulic modeling during the design phase. Hydraulic modeling would be performed in coordination with LGRP monitoring and modeling described above for the maintenance period. Any potential impact identified by the modeling would be mitigated prior to discontinuing maintenance. For example, the Pond A8 weir may be modified to maintain an acceptable flow split between Alviso Slough and the Pond A8 complex as determined by the LGRP. Implementation of flood protection measures through the South San Francisco Bay Shoreline Study or restoration actions through the SBSP Restoration Project could address fluvial flood risks in the long-term.

Alternative 6: No Project

Under the No Project alternative, the District would take no action to widen or deepen Alviso Slough between Gold Street and the Alviso County Marina. In the short-term, the No Project alternative would not affect existing flood conveyance or water surface elevations.

In the long-term, sedimentation may continue to occur in Alviso Slough, thereby decreasing flood conveyance, increasing water levels in the Project reach, and changing the distribution of 100-year flood flows between Alviso Slough and the Pond A8 complex, These effects would be evaluated and mitigated as needed (e.g., through levee improvements, new levee construction, and/or periodic channel dredging) by the District as part of the LGRP ongoing capacity assessment and operations and maintenance plan.

These impacts are considered **Less Than Significant.**

Global climate change and sea level rise. Future sea level rise would affect long-term flood performance as well. Because sea level is rising in response to a variety of factors not under the control of the Project, impacts due to sea level rise are not considered Project impacts, but are considered in Chapter 4, Cumulative Impacts. Future sea level rise is not expected to significantly affect sedimentation rates in Alviso Slough or Project maintenance requirements within the initial 10-year maintenance cycle. It is uncertain whether future global climate change would affect regional precipitation patterns and Lower Guadalupe River flood flows.

Impact HYD-2: Increased levee erosion along downstream channel banks.

The proposed vegetation removal and dredging would increase the open water area and volume of tidal water (tidal prism) in the Project area, thereby increasing tidal flows in the downstream reaches of Alviso Slough. The increased tidal flows would likely widen and deepen Alviso Slough over time. Significant channel widening has the potential to erode the levees along Alviso Slough, especially in locations where the fringing marsh between the channel bank and the levees is narrow.

The managed pond levees to the west of the Project area and downstream were originally constructed for commercial salt production. Though they are not maintained for flood protection, they provide some level of flood protection for the managed ponds and, indirectly, for the community of Alviso. The ponds and levees are owned and maintained by USFWS, as part of the Refuge.

In most places along Alviso Slough, the wide band of vegetated marsh between the slough channel and the levees would allow ample room for channel widening. The channel is closest to the toes of the levees between 1,700 ft (520 m) and 5,500 ft (1,675 m) downstream of the UPRR, from near the existing marina (SBYC) to downstream of the Old County Marina (now the Alviso Marina County Park). In this reach, the channel width from a surveyed typical cross-section is 131 ft (40 m), and the minimum distance between the levee toes is 230 ft (70 m). The modeled existing tidal prism at the typical cross-section is 276 ac-ft (PWA 2007).

The potential for impacts was analyzed using hydraulic geometry relationships, which are empirical correlations between tidal flows and channel dimensions specific to a geographic area, in this case San Francisco Bay (Williams, Orr et al. 2002). These relationships provide rough estimates of potential channel depths and widths in response to changes in tidal prism. The increase in downstream tidal prism for each alternative was estimated as equal to the volume of material removed (vegetation removal and dredging) within the intertidal zone. Hydrodynamic modeling results of typical tidal conditions were not available to provide a more detailed estimate. The increase in tidal prism may be less than the estimates used for the impact analysis, based on hydrodynamic modeling for the Pond A8 Phase 1 Action (PWA 2007). The predicted channel deepening and widening estimated below for each alternative covers the reach of Alviso Slough from the Pond A8 weir downstream to approximately mid-slough (i.e., halfway between the UPRR and the mouth of Alviso Slough). Hydrodynamic modeling and impact analysis for the SBSP Phase 1 Action at Pond A8 (PWA 2007) indicate that downstream of the mid-slough point, the Pond A8 tidal prism increases in the project vicinity have negligible effects on downstream tidal prism and channel widths. Tidal prism increases with the Alviso Slough restoration are less than for the Pond A8 Phase 1 Action with a 20-foot notch opening. The hydraulic geometry calculations of channel widths for the Alviso Slough Restoration Project are documented in Appendix B of the Project's Engineer's Report (EDAW, PWA et al. 2008). Post-project channel widths were calculated for vegetation and root mass removal to depths of one to four feet. The impact assessments below use the larger end of this range (four foot removal depth) to provide a more conservative (higher) estimate of potential Project impacts. The findings of the impact assessment are not affected by using the upper or lower end of the range.

The channel scour is inherently difficult to predict, and hydraulic geometry is only an approximate prediction tool. Hydraulic geometry predictions contain a large amount of uncertainty. It is uncertain whether channel widening would occur preferentially on one side of the channel. The exact location of channel scour with respect to the centerline cannot be estimated. Also, there is evidence that channel widening downstream of levee breaches is less than would be predicted using hydraulic geometry relationships (Williams, Orr et al. 2002).

Widening the channel and reducing the width of the fringing marsh between the channel bank and the levee toes could also result in higher velocities at the levee toes during flood events and increased wave action on the levees due to locally generated wind waves. Increased velocities and wave action could increase rates of levee erosion.

Alternatives 1, 2, 3, and 4

Alternatives 1, 2, 3, and 4 would dredge and/or remove vegetation and root mass within the intertidal zone, thereby increasing the downstream tidal prism.

Of Alternatives 1 through 4, Alternative 4 would result in the largest increase in tidal prism and has the greatest potential to cause tidal scour and levee erosion. Alternative 4 would increase the tidal prism by approximately 58 ac-ft (71,540 m^3) relative to the baseline conditions (a 21 percent increase). Downstream of the old County Marina, where the channel is closest to the toes of the levees, the existing channel width is 131 ft (40 m) and is predicted to increase by 16 ft (5 m) wider than the existing channel. This reach of the channel is fringed by a band of tidal marsh with a minimum width of 15 ft (4.5 m) between the west channel bank and levee toe and 80 ft (24 m) between the east bank and levee toe.

The potential for Alternatives 1, 2, 3, and 4 to cause levee erosion along downstream channel banks is negligible and this impact is considered **Less Than Significant.**

Alternative 5: Vegetation and Root Mass Removal (15.3 acres) and Dredging (9.7 acres) to 10-foot depth

Alternative 5 would remove approximately 15.3 acres of vegetation and root mass to a depth of up to four feet below the existing grade and dredge sediments over an area of 9.7 acres to a depth of 10 feet below the existing grade, thereby increasing the downstream tidal prism by approximately 151 ac-ft (186,260 m3) relative to baseline conditions (a 55 percent increase). Alternative 5 would likely cause tidal scour in Alviso Slough downstream of the Project, bringing the channel edge closer to the levees along the banks of the slough along these reaches. Downstream of the old County Marina, where the channel is closest to the toes of the levees, the existing channel width is 131 ft (40 m) and is predicted to increase by approximately 40 ft (12 m) wider than the existing channel. This reach of the channel is fringed by a band of tidal marsh with a minimum width of 15 ft (4.5 m) between the west channel bank and levee toe and 80 ft (24 m) between the east bank and levee toe. Although predictions based on hydraulic geometry calculations suggest that the channel is unlikely to scour through the fringe marsh to the levee toe, channel scour is inherently difficult to predict and actual erosion may be greater (or less) than predicted given the uncertainties discussed above.

Widening the channel and reducing the width of the fringing marsh between the channel bank and the levee toes would result in higher velocities at the levee toes during flood events and increased wave action on the levees due to locally generated wind waves, with the potential to increase rates of levee erosion. Given the relatively short fetches between the levees, it is not expected that wind wave action within the slough would be sufficient to induce additional levee erosion.

These impacts are considered **Less Than Significant with Mitigation** after implementation of the following mitigation.

- **Mitigation Measure HYD-D: Monitoring and inspections.** Channel widening shall be monitored and the levees would be regularly inspected after Project implementation as stated in the Maintenance Program section of the Project's Engineer's Report (EDAW, PWA et al. 2008). As discussed in the Maintenance Program section, monthly monitoring and levee inspections shall be performed initially, then annually, and after major rainfall or tidal storm events. The maintenance of or improvements to Alviso Slough levees downstream of the Project shall be performed by District as per its responsibility for impacts directly attributable to this project.

Alternative 6: No Project

Under the No Project alternative, the District would take no action to widen or deepen Alviso Slough between Gold Street and the Alviso County Marina. The No Project alternative would not increase the tidal prism or cause tidal scour in Alviso Slough downstream of the Project. This alternative results in **No Impact.**

Impact HYD-3: Increased levee erosion within the Project area.

The District maintains an existing flood protection levee along the east side of Alviso Slough adjacent to the Project area. The USFWS owns and maintains an existing managed pond levee along the west side of Alviso Slough adjacent to the Project area. The proposed vegetation and sediment removal in Alternatives 1, 2, 3, 4, and 5 would increase the open water area of Alviso Slough. Since mudflats and fringing marsh serve to dissipate wave energy, a reduction in their area would cause greater wave energy from locally generated wind waves within the slough to be incident on adjacent levees, potentially increasing rates of levee erosion. Given the relatively short distance of open water within the Project area over which winds would blow and generate waves (i.e., relatively short wind fetches), even after restoration, it is not expected that wind wave action within the slough would be sufficient to induce additional levee erosion.

Alternatives 1, 2, 3, 4 and 5

The proposed vegetation and sediment removal in Alternatives 1, 2, 3, 4, and 5 would also reduce channel roughness at the edges of the channel, thereby causing higher velocities closer to the levees within the Project area during fluvial flood events. This would increase the potential for eroding the levees within the Project area during flood events.

These impacts are considered **Less Than Significant with Mitigation** after implementation of the following mitigation.

- **Mitigation Measure HYD-E: Regular inspection of levees within Project area.** The levees within the Project area shall be inspected regularly after Project implementation as stated in the Maintenance Program section of the Project's Engineer's Report (EDAW, PWA et al. 2008). Levees along Guadalupe Slough will be inspected after an extreme event that triggers an overflow from Alviso Slough to Pond A8 and the other adjoining ponds (A5 – A7) in that complex. This inspection will assess any damages or erosion to these levees as a result of the flood management practices in place. Alviso Slough levees within the Project area shall be maintained or improved as needed (grading, armoring) to maintain flood protection and protect managed ponds from daily tidal inundation. This work would require ongoing coordination with USFWS.

Alternative 6: No Project

Under the No Project alternative, the District would take no action to widen or deepen Alviso Slough between Gold Street and the Alviso County Marina. The No Project alternative would not increase the potential for eroding the levees within the Project area during flood events. This alternative results in **No Impact.**

Impact HYD-4: **Increased coastal flood risk.**

Alternatives 1, 2, 3, 4 and 5

The proposed mitigation for Impact HYD-1 (Increased fluvial flood risk) would re-grade the Pond A8 overflow weir, lowering its elevation by approximately 0.5 to 1.4 ft. The post-project weir elevations would range from 10.7 to 11.4 ft NAVD for the various alternatives, thereby increasing the frequency that the weir would be overtopped ~~risk of flooding~~ by extreme water levels in the Bay. The 100-year coastal flood elevation ~~water level~~ at the mouth of Alviso Slough was estimated at 10.99 ft NAVD (U.S. Army Corps of Engineers 1984) and 11.02 ft NAVD (PWA 2006). Given that 100-year flooding along lower Alviso Slough is driven by high river flow events, not flooding from the Bay, and the ~~The modeled water surface elevation for a combined 10-yr tide and 100-yr fluvial flood event exceeds the 100-yr water level. Given that the~~ overflow weir is designed and maintained to be overtopped, this impact is considered **Less Than Significant.**

Alternative 6: No Project

Under the No Project alternative, the District would take no action to widen or deepen Alviso Slough between Gold Street and the Alviso County Marina. The No Project alternative would not result in an increased coastal flood risk. This alternative results in **No Impact.**

3.1.4 Relationship to South Bay Salt Ponds Phase 1 Action at Pond A8

This section discusses the combined impacts of the Alviso Slough Restoration Project and the SBSP Phase 1 Action at Pond A8. Implementation of a Phase 1 action at Pond A8 would introduce limited tidal exchange to create approximately 400 acres of muted subtidal habitat in Pond A8 and modify water depths in about 1,000 acres of existing shallow water habitat in Ponds A5 and A7 (PWA 2007). The Pond A8 Phase 1 Action is designed to be adaptable and reversible so that in the event that unacceptable ~~ecological~~ impacts begin to occur as a result of the Pond A8 Phase 1 Action, tidal exchange to Pond A8 can be modified or eliminated to prevent long-term adverse impact. In the event that the Pond A8 action is reversed, water management at Ponds A5 and A7 would revert to the Initial Stewardship Plan operations.

Impact HYD-1: **Increased fluvial flood risk.**

Summary – Common to All Alternatives

Implementation of the Phase 1 action at Pond A8 would open the pond to limited tidal flow through the armored notch for all or part of the year. Opening the notch would increase water levels in Ponds A8, A5, and A7 over current operation levels (PWA 2007). Ponds A5, A6, A7 and A8 along Alviso Slough are currently used for flood water storage during high fluvial flow events in the Guadalupe River / Alviso Slough system. The increase in water levels due to the Pond A8 Phase 1 Action would reduce the available off-line flood storage volume in Ponds A5, A7 and A8. However, the Pond A8 Phase 1 Action would be reversible, allowing the system to be managed seasonally and operated similar to baseline conditions or with a smaller notch width in the winter flood season.

Operating the notch seasonally would allow the ponds to be drained in time for the winter season when heavy rainfall and fluvial flooding events occur. If the Pond A8 notch were operated seasonally and closed during the winter flood season, fluvial flood conditions would be identical to conditions with only Alternatives 1 through 6 (no Pond A8 Phase 1 Action). Impacts to fluvial flood risks with the Pond A8 notch closed would be identical to those discussed above (Section 3.1.3) for Alternatives 1 through 6 of the Alviso Slough Restoration Project.

Hydraulic modeling indicates that seasonal closure of the notch may not be necessary from a flood protection perspective. If this is the case, keeping the notch open year-round would be desirable for meeting the Pond A8 Phase 1 Action. Modeling would be required to assess the combined effects of the Alviso Slough Restoration Project and the Pond A8 Phase 1 Action with the notch open in the winter.

Alternatives 1, 2, 3, 4 and 5

For Alternatives 1-5, impacts are considered **Less than Significant with Mitigation** after implementation of the following mitigation measure:

- **Mitigation Measure HYD-F: Coordination with operations and maintenance of Pond A8 Phase 1 Action.** The Alviso Slough Restoration project shall be coordinated with USFWS's operations and maintenance of the Pond A8 Phase 1 Action, taking into account post-construction, maintenance period, and long-term conditions for the Alviso Slough Restoration Project, so that operation of the Pond A8 notch does not increase the fluvial flood risk. Modeling shall be conducted to assess the combined effects of the Alviso Slough Restoration Project and the Pond A8 restoration with the notch open in the winter. If modeling indicates a potential flood impact, the Pond A8 notch shall be closed in the winter. Requires coordination with USFWS.

Alternative 6: No Project

Alternative 6 would result in **No Impact**.

Impact HYD-2: **Increased levee erosion along downstream channel banks.**

Summary – Common to All Alternatives

Hydrodynamic modeling performed for the Phase 1 action at Pond A8 indicate that the Pond A8 Phase 1 Action would increase the tidal prism in Alviso Slough downstream of the Pond A8 notch (PWA 2007). The modeled tidal prism increases in Alviso Slough after Phase 1 action at Pond A8 steadily decrease from the notch to mid-slough (midway between the notch and the slough mouth), where increases are negligible. Based on the modeling results, scour is expected to occur between the notch and mid-slough.

The Pond A8 notch would be sized such that the predicted scoured channel width for Alviso Slough would be less than or equal to the distance between the east bank and west bank levee toes (230 ft. or 70

m) (PWA 2007). The size of the notch would be refined in the design phase and the potential for levee erosion would be assessed in greater detail. Depending on the results of assessment, the notch could be designed to be adjustable in size.

If both the Alviso Slough restoration and the Pond A8 Phase 1 Action would be implemented, Pond A8 could be operated with a smaller notch opening and still achieve the Pond A8 Phase 1 Action objectives, in particular the objectives for downstream channel widening.

Alternatives 1, 2, 3, 4 and 5

For Alternatives 1-5, impacts are considered **Less than Significant with Mitigation** after implementation of the following mitigation measure:

- **Mitigation Measure HYD-G: Monitor channel widening, inspect levees, and maintain or improve levees.** The District shall assess in greater detail in the design phase the potential for levee erosion due to the cumulative increase in tidal prism from the Alviso Slough Restoration Project and the Phase 1 Action at Pond A8. The District shall coordinate with the USFWS's operation of the Pond A8 notch such that the predicted scoured channel width for Alviso Slough would be less than or equal to the distance between the east bank and west bank levee toes. The District shall monitor the channel widening and inspect the levees regularly after Project implementation as stated in the Maintenance Program section of the Project's Engineer's Report (EDAW, PWA et al. 2008). The District shall maintain or improve the Alviso Slough levees downstream of the Project (e.g., grading, armoring) as per its responsibility for impacts directly attributable to the Alviso Slough Restoration Project. Coordination with USFWS on its Pond A8 Phase 1 Action shall take into account post-construction, maintenance period, and long-term conditions for the Alviso Slough Restoration Project.

Alternative 6: No Project

Alternative 6 would result in **No Impact**.

Impact HYD-3: **Increased levee erosion within the Project area.**

Alternatives 1, 2, 3, 4 and 5

Impacts of the Alviso Slough Restoration Project and the Pond A8 Phase 1 Action to levee erosion within the Project area would be identical to those discussed above (Section 3.1.3) for Alternatives 1 through 5 of the Alviso Slough Restoration Project (no Pond A8 Phase 1 Action). After implementation of mitigation measure HYD-E discussed in Section 3.1.3, this impact is considered **Less Than Significant with Mitigation.**

Alternative 6: No Project

Alternative 6 would result in **No Impact**.

Impact HYD-4: **Increased coastal flood risk.**

Alternatives 1, 2, 3, 4 and 5

Impacts of the Alviso Slough Restoration Project and the Pond A8 Phase 1 Action to coastal flood risk would be identical to those discussed above (Section 3.1.3) for Alternatives 1 through 5 of the Alviso

Slough Restoration Project (no Pond A8 Phase 1 Action). This impact is considered **Less Than Significant**.

Alternative 6: No Project

Alternative 6 would result in **No Impact**.

3.1.5 Sediment Disposal Options

Sediment disposal options include trucking, barging, or conveying (e.g., slurry pipeline) the dredged sediment to a location where it could be re-used, rather than trucking the material to the Newby Island landfill, as described in Chapter 2. Disposal options other than trucking would have little effect on the hydrology and geomorphology of the slough. Impacts and mitigation measures would be similar as described for the trucking options.

This page intentionally left blank.

3.2 WATER AND SEDIMENT QUALITY (WQ)

Potential impacts to surface water, sediment, and groundwater quality are analyzed in this section. The regulatory authorities are discussed, including a summary of federal, state, and regional agencies and their roles in managing surface water, sediment, and groundwater quality. ~~The state of California's Water Quality Standard's Program is the primary basis for determining thresholds for impacts, although U.S. EPA can promulgate standards and intercede in federal actions. The state's program is a continuous planning process and accounts for regional or site-specific differences that may affect water quality. Therefore, water quality objectives may also vary in space and time. This needs to be considered for emerging programs such as the mercury Total Maximum Daily Load (TMDL) and the polychlorinated biphenyls (PCBs) TMDL. The regional and Project area physical settings are described prior to analysis of project impacts for each alternative.~~ The state's water quality control plan policies expressed through the Regional Board Basin Plan form the basis for determining thresholds for impacts.

3.2.1 Regulatory Setting

Water and sediment quality in the regional setting and Project area are regulated under the authority of federal, state, and local agencies through the policies and plans described in Table 3.2-1 below.

Table 3.2-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
FEDERAL	
RWQCB *Clean Water Act (CWA), Section 401*	CWA Section 401(a)(1) specifies that any applicant for a federal license or permit to conduct any activity that may result in discharges into navigable waters shall provide the federal licensing or permitting agency with a certification that any such discharge will not violate state water quality standards. In California, the nine regional water quality control boards (RWQCBs) administer the Section 401 program, prescribing measures for projects as necessary to avoid, minimize, and mitigate adverse impacts on water quality and ecosystems.
SWRCB, RWQCB *TMDL Program*	The TMDL program carries out the State's responsibility under Section 303(d) of the CWA, which is to develop a list of impaired waterbodies, and establish watershed plans to attain water quality standards for all impaired waterbodies that fail to meet standards after implementation of Best Attainable Technology on point sources that are permitted by the National Pollutant Discharge Elimination System (NPDES). TMDL plans establish numeric targets that correspond to attainment of water quality standards.
STATE	
SWRCB, RWQCB *Porter-Cologne Water Quality Control Act*	The Porter-Cologne Water Quality Control Act (California Water Code, Division 7. Water Quality, 2009) provides the basis for water quality regulation within California. This act allows the State Water Resources Control Board (SWRCB) to adopt statewide water quality control plans or basin plans. The purpose of the plans is to establish water quality objectives for specific waterbodies. ~~water bodies. Most of the~~ Local implementation ~~of SWRCB's responsibilities~~ is delegated to the nine regional boards. The San Francisco Bay RWQCB has prepared the San Francisco Bay Basin Plan that establishes water quality objectives and implementation

Agency + Plan or Policy	Overview & Applicability
	programs to meet the stated objectives and to protect the beneficial uses of the Bay waters. ~~The SWRCB, acting through the RWQCBs, must certify that a USACE permit action meets state water quality objectives. Under the Porter-Cologne Water Quality Control Act, wetlands and drainages that are considered waters of the U.S. by USACE are often classified as waters of the state as well. Impacts on waters of the state are authorized through Waste Discharge Requirements, which typically require mitigation requiring no net loss of wetlands functions and values of waters of the state.~~
~~**SWRCB, RWQCB**~~ ~~*TMDL Program*~~	~~The TMDL program carries out the State's responsibility under Section 303-d of the CWA, which is to develop a list of impaired waterbodies, and establish watershed plans to attain water quality standards for all impaired waterbodies that fail to meet standards after implementation of Best Attainable Technology on point sources that are permitted by the National Pollutant Discharge Elimination System (NPDES). TMDL plans establish numeric targets that correspond to attainment of water quality standards. Two TMDLs are discussed at length in this section: Mercury and PCBs. Both plans set targets for pollutant concentrations in fish that need to be considered when evaluating the potential for impacts.~~
RWQCB *Guidelines for the Beneficial Re-use of Dredged Sediments*	The RWQCB has established draft guidelines for the placement of dredged sediments in wetlands as either foundation or cover material. While these guidelines are still in draft form, they are used throughout the region to make decisions about the suitability of material for re-use in wetland projects. They should, therefore, be considered in this analysis, with the qualifier that as draft guidelines, they may be replaced with site-specific risk assessments.
~~None~~ BCDC	Dredging and disposal activity in San Francisco Bay, marshes and some creeks requires a permit from the Bay Conservation and Development Commission (BCDC). BCDC works with its federal, state and local partners in the Long Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region (LTMS) to manage dredging and disposal activities in the Bay Area. The Dredged Materials Management Office (DMMO) of BCDC reviews sediment quality sampling plans, analyzes the results of sediment quality sampling, makes suitability determinations for disposal, and offers a consolidated application that can be jointly processed for each agency's permits for dredging and disposal projects and beneficial reuse sites.

~~In~~ Water quality requirements in the ~~regional setting and~~ Project area ~~the regulatory setting is primarily~~ are defined by the San Francisco Bay RWQCB~~. The RWQCB defines~~ Water Quality Control Plan for San Francisco Bay (the Basin Plan). The Basin Plan designates beneficial uses of water ~~bodies~~ and specifies water quality objectives to protect such beneficial uses~~,~~ along with an implementation ~~plans in the Water Quality Control Plan for San Francisco Bay (the Basin Plan). Specific water quality objectives relevant to existing conditions are defined Appendix B. Amendments to the Basin Plan require approval by the SWRCB and the U.S. EPA.~~ plan to meet these goals.–The beneficial uses of South San Francisco Bay (SSFB) ~~identified in the Basin Plan include:~~ and the Guadalupe River relevant to the Project are:

- ~~Industrial service supply;~~
- Cold Fresh Water Habitat;
- Commercial and sport fishing;
- Shellfish harvesting;
- Estuarine habitat;
- Fish migration;
- Preservation of rare and endangered species;
- Spawning, reproduction, and/or early development of fish;
- Wildlife habitat;
- Water contact recreation;
- Non-contact water recreation; and
- Navigation.

~~Designated groundwater beneficial uses include municipal and domestic supply, agricultural supply, and industrial service supply.~~

~~Implementation of the Alviso Slough Restoration Project would improve the beneficial uses of water contact recreation and non-contact water recreation. Recreational boating is included in the non-contact recreation beneficial use. The navigation beneficial use specifies shipping and transportation, such as cargo ships and ferries, which are not the focus of this project. Water and sediment quality impacts are analyzed to determine if the Project would adversely impact the remaining beneficial uses within the regional setting and Project area.~~

Evaluation of the impacts of the Alviso Slough Restoration Project relies upon whether the activities could result in exceedances to the water quality objectives or conditions that could adversely affect, or improve, the beneficial uses of water. Therefore, the focus of the discussion is on potential water and sediment quality impacts to sensitive beneficial uses associated with wildlife, aquatic, and rare and endangered species habitats under the rationale that minimizing or avoiding impacts to such uses would likely prevent impacts to the remaining uses. Aspects of the project that will likely improve conditions such as increased opportunities for recreational boating (non-contact recreation) are noted but not central to the water quality analysis.

~~Water quality standards continually evolve to reflect new information and emerging contaminants of concern. New water quality objectives, including site-specific objectives may be developed. In situations where~~ In addition to the Basin Plan, the Guadelupe River system and SSFB have been identified as "impaired" waterbodies, meaning that water quality objectives are not attained~~, despite implementation of best attainable technological controls on point source discharges,~~ for certain pollutants, including mercury, PCBs and organochlorine pesticides. As a result, the Guadalupe and the SSFB are listed pursuant to Section 303(d) of the Clean Water Act and additional control programs known as TMDLs are required under state and federal law. ~~by the CWA. TMDLs are loads-based management strategies that address all pollutant sources in a watershed. The development of new water quality standards and related TMDL planning efforts are summarized at the end of this section.~~

To protect beneficial uses, the Basin Plan lists both narrative and numeric water quality objectives for surface and groundwater. Narrative objectives provide general guidance to avoid adverse water quality impacts. Narrative objectives relevant to this analysis include salinity, sediment (i.e., total suspended solids [TSS]), sulfides, toxicity, bio-stimulatory substances, bioaccumulation, and population and community ecology. The full narrative objectives are listed in Table B-1 in Appendix B.

Numeric water quality criteria included in the Basin Plan establish objectives for trace metals, dissolved oxygen, turbidity, temperature, pH, bacteriological pathogens, and un-ionized ammonia. In addition to the Basin Plan, the California Toxics Rule (CTR) establishes another set of relevant water quality objectives for aquatic life and human health protection for approximately 130 priority trace metal and organic constituents. Wherever two objectives differ between the CTR and the Basin Plan, the more stringent objective applies. Numeric water quality objectives are summarized in Tables B-2, B-3, and B-4, in Appendix B, pp. B-5-B-8.

~~While the RWQCB has primary authority for development of water quality standards, amendments to the Basin Plan are subject to approval by the SWRCB and the U.S. EPA. Both of those agencies may also undertake statewide initiatives that affect local water quality standards. For example, as discussed in Appendix B, the SWRCB is developing guidance for sediment quality objectives, and the USEPA is developing new selenium objectives applicable in the State of California.~~

There is guidance for the *Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines* (known as the Long-Term Management Strategy [LTMS] Guidelines; SFRWQCB, 2000), which is incorporated by reference in the Basin Plan. The LTMS guidelines define ambient sediment contaminant concentrations and ecological thresholds for the San Francisco Bay (see Table 3.2-7 at the end of this section). The ambient concentration limits are established through previous sampling efforts around "unimpacted" areas of San Francisco Bay.[1] Although the LTMS guidance is not a set of regulatory objectives, the SFRWQCB relies upon the guidance to determine the suitability for sediment reuse:

- sediment with contaminant concentrations (such as mercury) less than ambient levels is suitable for wetland cover material (the upper three feet);
- sediment with lower concentrations is suitable for wetland foundation material (greater than three feet below current or designed ground surface elevation).

Emerging Water Quality Standards Programs [see Appendix B, p. B-9]

~~There are several emerging programs that will result in new, enforceable water quality and sediment quality objectives:~~

- ~~The San Francisco Bay Mercury TMDL was approved by the SWRCB on July 17, 2007;~~
- ~~The draft Basin Plan Amendments and supporting documents for the San Francisco Bay PCB TMDL were released for public comment on June 22, 2007. The Board heard public testimony on~~

---

[1] The ecological thresholds defined in the guidelines are the Effects Range-Low (ER-L) and the Effects Range-Median (ER-M) established by the National Oceanic and Atmospheric Administration (NOAA). ER-Ls represent the concentration below which adverse biological effects are unlikely, while ER-Ms represent the concentrations above which adverse biological effects are likely.

~~September 12, 2007, and an adoption hearing is anticipated in 2008. Following Board adoption, approval by the SWRCB and the U.S. EPA is required.~~

- ~~The Bay Protection and Toxic Cleanup Program Legislation of 1989, coupled to a Court Order in 2001, requires the SWRCB to adopt sediment quality objectives;~~
- ~~The RWQCB has completed technical analysis necessary to adopt site specific objectives for copper and nickel North of the Dumbarton Bridge, and is considering amending the Basin Plan to reflect the new information developed;~~
- ~~The U.S. EPA is working with an interagency technical team, including the SWRCB, USFWS, NMFS, and USGS, to amend the selenium objective promulgated in the California Toxics Rule; and~~
- ~~Trash could be listed as an impairing pollutant in many urban creeks, including the Guadalupe River and Coyote Creek during the lifetime of this Project. Measures to reduce trash will likely be implemented through the Municipal Regional Permit for stormwater; if these do not succeed, a trash TMDL is a potential next regulatory step. Pathogens could follow a similar trajectory.~~

Proposed indicators of water and sediment quality resulting from these programs are considered in this analysis with respect to evaluation of impacts. Details on these emerging programs (except for the trash and pathogens TMDLs) are provided in Appendix B.

3.2.2 Physical Setting

The physical setting with respect to water and sediment quality is described in this section. ~~organized around four major categories of pollutants. Bioaccumulative pollutants (mercury, PCBs, legacy organochlorine pesticides, and selenium) are discussed first because they are one of the most complex and important water quality factors that need to be considered for potential impacts. Conventional toxic pollutants are discussed next. The main emphasis for conventional toxics is trace metals, although a brief discussion of petroleum hydrocarbons is also included.~~ Water quality objectives are designated to protect beneficial uses. Therefore, the discussion focuses on the existing conditions with respect to attainment of water quality objectives.

Fisheries Habitat Water Quality Parameters

Water quality concerns ~~parameters~~ related to healthy ~~fisheries~~ habitat for fish and aquatic species include dissolved oxygen, turbidity, ~~(DO, temperature~~, salinity, and temperature. ~~turbidity) are then described, followed by a summary of aesthetic-related water quality issues (trash, odors, phytoplankton and algae).~~ Tidal waters such as the Bay and Alviso Slough are designated in the Bay Basin Plan as cold and warm water fish habitat. For these waters, water quality objectives for DO, turbidity, salinity, and temperature are specified in the Basin Plan. The salt ponds in the greater South Bay and Project area are designated as estuarine habit. The characterization of estuarine habitat in the San Francisco Bay RWQCB Basin Plan recognizes that "Estuarine habitat is generally associated with moderate seasonal fluctuations in DO, pH, and temperature and with a wide range in turbidity."

Dissolved Oxygen

Low DO can cause mortality in aquatic and benthic organisms, increased mercury methylation rates, and increased rates of disease such as avian botulism. For the regional area and including Alviso Slough, the Basin Plan sets the DO objective at five milligrams per liter (mg/L), but acknowledges that a three month median concentration of 80 percent oxygen saturation is sufficient to protect beneficial uses of the area. In the adjacent salt ponds and tidal marsh, lower DO concentrations are a natural occurrence. Factors typically leading to oxygen depletion in estuarine environments are increased phytoplankton growth, low flow rates and low mixing.

During the period 1997 – 2001, 13 measurements of DO were made in the surface water of Alviso Slough at the dock of the Alviso Yacht Club (San Francisco Estuary Institute, 2002); all of these measurements were above 5 mg/L.

Dissolved Oxygen in Salt Ponds Adjacent to the Project Area

USGS measured dissolved oxygen in Alviso Ponds A8 and A12 during monthly sampling from 2002 to 2006. The majority of measurements ranged from 4 to 10 mg/L. While some measurements were below concentrations considered healthy for aquatic life, the proposed changes to Pond A8 and actions under the adaptive management plan for the South Bay Salt Ponds Project are expected to improve dissolved oxygen in the salt ponds and mitigate potential adverse affects on Alviso Slough.

Bioaccumulative Pollutants

~~Pollutants that~~ The project area is located in the area identified by the San Francisco Bay Mercury TMDL (SWRCB 2007) as having mercury and other pollutant-laden sediments. These pollutants are problematic to wildlife and public health because they tend to *bioaccumulate* ~~tend to~~ increase in the environment -- concentrations of the pollutants can ~~concentration at each successive step in~~ the food web. Relatively low concentrations of a bioaccumulative pollutant in water or sediment ~~typically~~ can enter the base of the food web ~~by accumulation in~~ via plants, algae, or bacteria. ~~Grazers that feed at the base of the food web retain the pollutants while metabolizing the proteins and lipids of their food, magnifying the pollutant concentration. Predators and foragers that feed on the grazers further magnify the concentration of bioaccumulative pollutants. One issue of concern common to all bioaccumulative pollutants is the quality of food available to~~ and eventually such elevated concentrations can result in toxic effects on people and wildlife that use plants and animals from the Bay as a source of food. ~~Another~~

For this project the issue ~~that is common to most of the~~ arising from bioaccumulative pollutants ~~considered~~ is the possibility that deposits of contaminated sediments may be exposed and remobilized as a result of activities associated with proposed project alternatives. ~~considered.~~ Bioaccumulative toxic pollutants of concern are mercury, PCBs, and legacy organochlorine pesticides (DDT, chlordane, dieldrin). Evaluating potential impacts to water quality and beneficial uses and establishing a threshold of significance requires analysis of the potential for exposed and remobilized contaminated sediment to increase the concentrations of such substances in the food web. These issues are discussed in more detail in Appendix B.

~~In San Francisco Bay, the persistent bioaccumulative toxic pollutants of primary concern are mercury, PCBs, legacy organochlorine pesticides (DDT, chlordane, dieldrin), and selenium. These pollutants have different sources, fates, and effects that are summarized below. What they have in common, for the purpose of this analysis, is that the endpoint of concern is their concentrations in the food web.~~

~~Mercury, PCBs, and legacy organochlorine pesticides have in common the fact that management strategies seek to reduce concentrations in sediments. This is not necessarily true for selenium, another bioaccumulative pollutant that is discussed separately.~~

Sediment-Associated Bioaccumulative Pollutants in the Regional Setting

Mercury and Methylmercury

Mercury is a ~~potent developmental~~ neurotoxin~~. This means~~ that ~~it~~ can affect the reproductive success of birds. ~~that forage the Bay and its margins for food.~~ Concerns about human consumers ~~are over the~~ focus on the potential for impaired learning abilities; and motor skills development in young children and the offspring of women who get a significant amount of their dietary protein from Bay fish. While there is presently no evidence of such effects in the Bay Area, risk guidance for mercury published by the U.S. EPA (2006) raises concern over the levels of mercury currently found in San Francisco Bay fish (San Francisco Estuary Institute, 2006).

Mercury bioaccumulates ~~mainly~~ in the form of *methylmercury*~~, which is a mercury atom bonded to a carbon atom. Methylmercury is produced by the normal metabolic activity of bacteria, especially sulfate reducing bacteria that thrive under~~ in low oxygen conditions, such as ~~those~~ found in wetlands and ponds adjacent to Alviso Slough. Different mercury sources may have greater or lesser propensities to be converted to methylmercury. Therefore, assessments of mercury risk have to account for the *availability* of different mercury sources to the bacteria that convert mercury to methylmercury.

~~For mercury, the key~~ Key points related to the regional setting are:

- Mercury-contaminated sediments are known to exist in the regional setting and in the Project area as a result of historic discharges from the New Almaden Mercury mines, as well as atmospheric deposition and other sources.
- Mercury-contaminated sediments continue to discharge into Alviso Slough as a result of legacy contamination in the Guadalupe River Watershed (McKee et al., 2006). ~~The discharge is episodic, occurring mostly during high flow storm events.~~ This input is expected to be reduced over time as a result of implementation of the Guadalupe River Mercury TMDL.
- ~~While there are many factors that affect mercury methylation, low~~ Low dissolved oxygen (DO) is known to increase production of methylmercury by promoting the growth of bacteria that convert mercury to methylmercury (Brown and Caldwell, 2004 ~~and references cited therein~~). Wetlands and marshes trap sediments that may contain mercury and at times are sites of low DO and elevated microbial activity, and thus can be areas with relatively higher net methylation rates.
- The ~~structure of the~~ food web plays an important role in bioaccumulation; the risk of methylmercury bioaccumulation from methylmercury concentrations alone cannot be reliably predicted. Sentinel species are important to detect significant impacts to mercury accumulation in the food web.
- Mercury methylation is a function of mercury availability and the rate of conversion to methylmercury (the methylation rate). ~~This means that increases in mercury availability can result in no net increase in mercury methylation if the methylation rate decreases.~~
- The Mercury TMDL established numeric targets for mercury in fish tissue that have been adopted as numeric water quality objectives by the RWQCB (Table 3.2-2 below). Mercury measured in

fish tissue from samples collected in the Bay is compared to these objectives to assess impairment.

- The Mercury TMDL also established a numeric target for mercury in suspended sediments of 0.2 mg/kg. Suspended sediments of South San Francisco Bay are generally two-fold higher than this target at present.

These points are discussed in greater detail in technical support documents to the SBSP Restoration Project (Brown and Caldwell, 2004; Brown and Caldwell, 2006), and in Appendix B.

Table 3.2-2 Water Quality Objectives for Mercury established by the RWQCB Mercury TMDL

Protection of Human Health	0.2 mg mercury per kg fish tissue	Average wet weight concentration measured in the edible portion of trophic level 3 and trophic level 4 fish.
Protection of Aquatic Organisms and Wildlife	0.03 mg mercury per kg fish	Average wet weight concentration measured in whole fish 3–5 cm in length.
Suspended sediments	0.2 mg/kg	Computed as the annual median of RMP monitoring results.

Note: Mercury in suspended sediments is related to bioaccumulation.

PCBs and Legacy Organochlorine Pesticides in the Regional Setting See Appendix B pp 17-21

~~The knowledge base of PCBs sources, fate, and effects in San Francisco Bay is summarized in a conceptual model and impairment assessment report prepared for the Clean Estuary Partnership (Davis et al., 2006). The discussion below summarizes some of the key points of that report needed to understand PCBs in the regional setting and in the Project area.~~

~~PCBs are a class of man-made chemicals that were widely used from the 1930's until their production was banned effective 1979. There are 209 individual compounds, or "congeners" that are collectively referred to as PCBs. PCBs were used as industrial lubricants, in building materials, and in electrical transformers. Although new production in the U.S. was banned in 1979, the use of PCBs in completely closed electrical transformers remains legal to this day. The life expectancy of such transformers is decades; thus, hundreds of thousand of kilograms of PCBs remain in use in the Bay Area. This inventory will gradually decline over time as old transformers are replaced. PCBs were also used as pump lubricants in natural gas transmission lines. Bleeding off of excess lubricant during periodic maintenance can lead to release of PCBs if the lubricant is not properly disposed.~~

~~PCBs are an environmental concern because they are potent carcinogens that are extremely persistent in the environment. They accumulate in the fats of organisms and are transferred up the food chain, increasing in concentration at each step. In contrast to mercury, where microbial transformations are the key to bioaccumulation, biochemical transformation of PCBs is not a necessary precursor to biomagnifications. Consequently, the conceptual model for management of PCBs in the Bay relies upon more direct food web models relating PCB concentrations in sediments to PCB concentrations in fish.~~

~~As with mercury, the~~ The preliminary fish tissue target for PCBs that has been ~~proposed~~ tentatively adopted by the San Francisco Bay RWQCB for a Baywide TMDL is based on protecting people and wildlife that eat fish from the Bay. The resulting proposed risk-based target is 10 nanograms per gram (ng/g) in fish. The corresponding sediment goal ~~target proposed by the San Francisco Bay RWQCB~~ is one ppb (i.e., one micrograms of PCBs per kilogram of sediment). ~~These values should be kept in mind when considering PCB concentrations in sediments and fish in the regional setting and in the Project area.~~

~~Legacy Organochlorine Pesticides in the Regional Setting~~

~~Like PCBs, organochlorines were once widely used in pesticides and are hazardous to humans. Their use has been banned in the Unites States since 1978. One important distinction between legacy organochlorines and PCBs is the degree of impairment. Unlike PCBs and mercury, impairment of wildlife is considered to be unlikely, so protection of human health is the primary driver for managing this class of compounds. Legacy organochlorines appear to be much closer to attainment of risk-based screening values compared to PCBs. These screening values are established by the California Office of Environmental Health Hazard Assessment (OEHHA) and are based on assumptions about how much fish people eat on a daily basis. Because these compounds have been banned and the degree of impairment is less severe, TMDL development and resulting implementation strategies are proceeding on a less aggressive time scale.~~

Sediment-Associated Bioaccumulative Pollutants Near the Project Area

The South Baylands Mercury Project collected core samples to depths of six feet from transects ~~on~~ in the marsh ~~plain~~ on either side of Alviso Slough, as well as from the center of the channel, downstream of the Project Area. The locations of the cores ~~analyzed~~ are shown in Figure 3.2-1. The cores were divided into subsections and analyzed for total mercury and reactive mercury to characterize risk due to mobilization of mercury-contaminated sediments. ~~Mercury concentrations and chemical forms in core samples collected by the South Baylands Mercury Project are reported in a USGS Open File Report (Marvin-Dipasquale and Cox, 2007). By coordinating with the South Baylands Mercury Project team, consultants for the Alviso Slough Restoration Project were able to provide supplemental data on PCBs and legacy organochlorine pesticides in three of the~~ Three cores closest to the project site~~,~~ (as shown in Figure 3.2-~~2~~1 as ~~(~~AS-T1A, AS-T1B, and AS-T1C) were analyzed for PCBs, legacy pesticides and mercury. The results of the analysis are provided in Table 3.2-3.

Summary of mercury, PCB, and organochlorine pesticide Concentrations Near the Project Area

The results of the South Baylands Mercury project, along with other data sources cited in Appendix B, are used to predict likely concentrations of mercury, PCB, and organochlorine pesticide in the Project area. All of the cores collected by the South Baylands Project are approximately six feet deep. This is shallower than many of the dredging alternatives considered for the Alviso Slough Restoration Project.

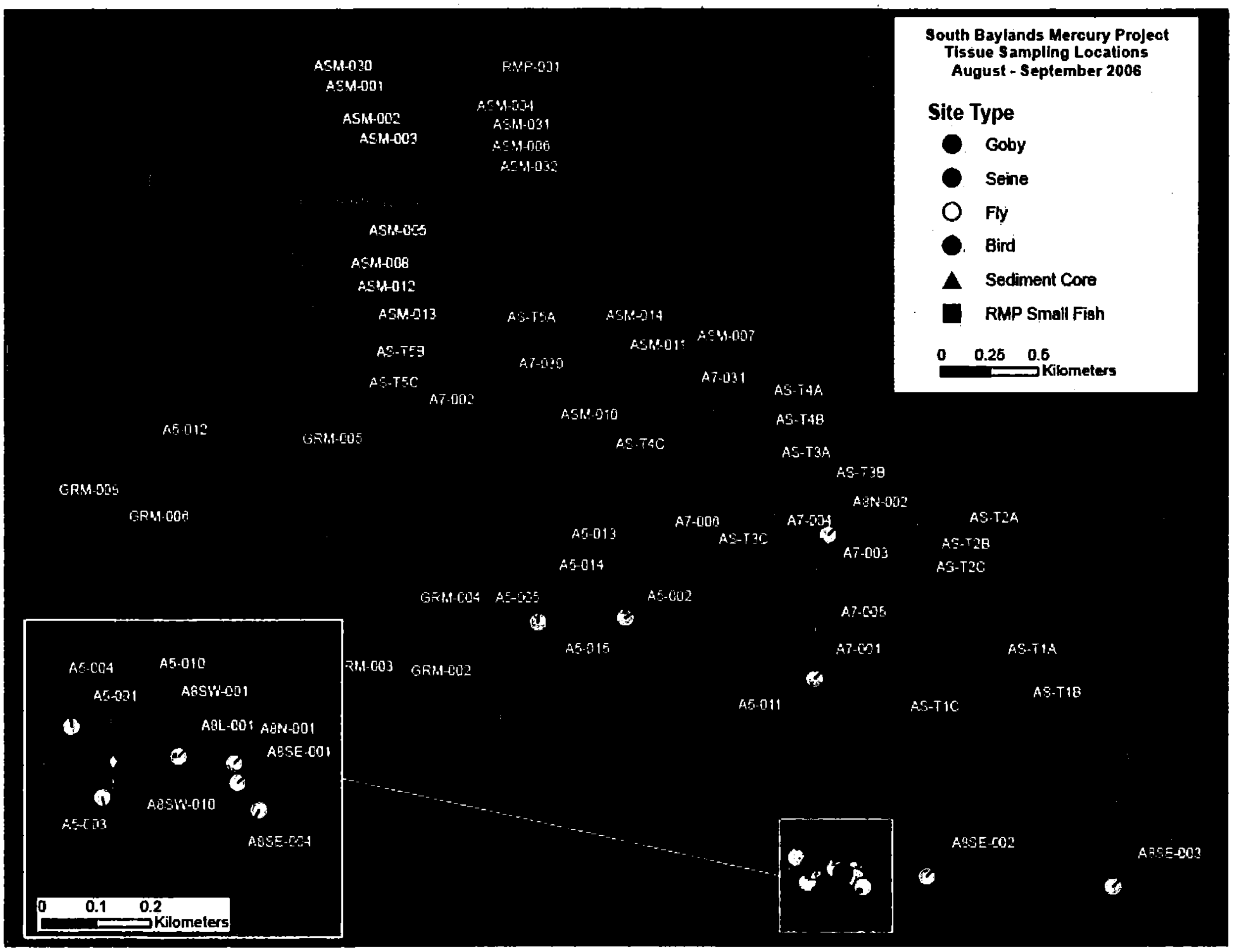


Figure 3.2-1 Location of samples collected by the South Baylands Mercury Project

Note: Triangles indicate core sediment samples collected in September, 2006 available for this study.

Mercury concentrations in the numerous cores collected from the South Baylands Mercury Project (shown above in the Figure 3.2-1) ranged from 80 to 2,830 micrograms per kilogram (µg/kg), with a median of 800 µg/kg. Mercury concentrations in the sediment cores ~~AS-T1A, AS-T1B, and AS-T1C~~ ranged from 470 to 1,420 µg/kg, with a median of 740 µg/kg. One of the key ~~findings~~ results of the study was that there was not a statistically significant variation in the total mercury concentration over the vertical depths of the cores. Another important finding was that the relative amount of reactive[2] mercury ~~is much higher~~ near the top few inches of the surface is ~~(~~around 10 percent~~)~~ of the total, compared to one percent of the total ~~reactive mercury~~ at depth ~~(around one percent)~~ (Marvin-Dipasquale and Cox, 2007).

---

[2] *Reactive* mercury is measured by laboratory techniques, and is considered ~~and~~ an indicator of the relative amount of mercury *available* for methylation. ~~The difference between reactive mercury and available mercury is that the former is a measurement that predicts the latter, which is a chemical property that depends on site-specific conditions.~~

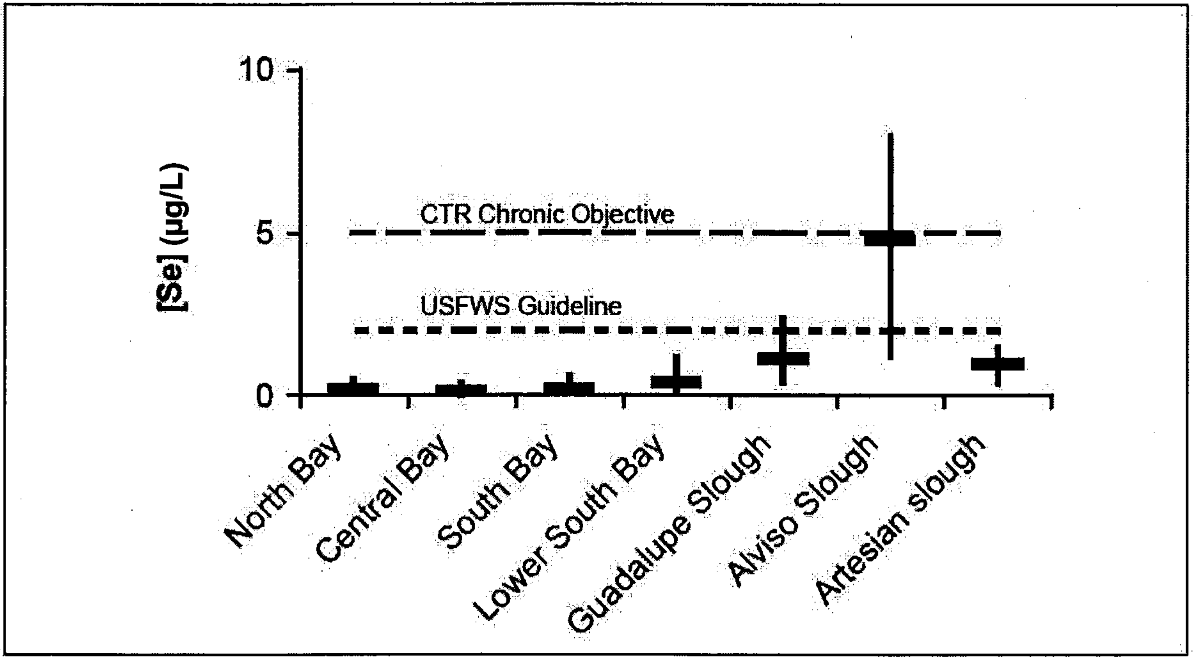


Figure 3.2-2 Selenium concentrations in water measured by the RMP

Note: The solid heavy horizontal lines represents the mean concentration, the vertical lines represent the range. Figure from (Abu-Saba and Ogle, 2005)

In terms of potential mercury impacts of the Project, the primary issue of concern does not appear to be remobilization of deeper sediments that are more contaminated with mercury compared to those at the surface. Rather, the issue to consider is the possibility that deepening Alviso Slough would increase the amount of reactive mercury in deeper sediments, potentially causing a transient or longer-term "spike" in the production of methylmercury. Because methylmercury production is a product of available mercury and methylation rates, activities that reduce methylation rates, such as vegetation removal, would tend to offset transient increases in available mercury. The concentrations of mercury, PCBs and legacy organochlorines in sediments found in the transect closest to the study area are summarized in Table 3.2-~~2~~3 below.

Selenium -- See Appendix B pp. B-32-33

~~Selenium is a naturally occurring element and is important for human health. However, in excessive concentrations it can be deleterious to human health and animals. The current state of knowledge for selenium has been summarized in a conceptual model / impairment assessment report prepared for the Clean Estuary Partnership (Abu-Saba and Ogle 2005). While selenium is known to accumulate in aquatic ecosystems, there are important differences that set it apart from the previously discussed bioaccumulative pollutants. A key difference is that selenium is much more soluble. Current water quality endpoints are focused on water column concentrations, rather than sediment concentrations. Emerging water quality standards will likely consider food web concentrations as well.~~

Table 3.2-~~2~~3 Concentrations of mercury, PCBs, and legacy organochlorine pesticides in sediment cores collected Bayward of the Project Area~~.~~

All values shown are in µg/kg (parts per billion)

Contaminant	Top half of cores AS-T1A, AS-T1B, and AS-T1C	Bottom half of cores AS-T1A, AS-T1B, and AS-T1C	~~TMDL Target~~*
Mercury	585 ± 292	933 ± 49	~~200~~
PCBs	52 ± 17	173 ± 17	~~1~~
DDTs (sum of)	27 ± 5	48 ± 16	~~NA~~
Chlordanes (sum of)	3.7 ± 2.3.	16 ± 9	~~NA~~
Dieldrin	ND (<0.05)	2.0 ± 0.2 in bottom half.	~~NA~~

Note: Bayward of the Project Area, as illustrated in Figure 3.2-1, is the area labeled "Cores analyzed for PCBs," located, northwest of the Project Area.

* TMDL Target information removed to avoid confusion. No targets for DDTs, Chlordanes, and Dieldrin.

~~The U.S. EPA has established the current water quality objective for selenium at five ppb in water through the California Toxics Rule. U.S. EPA has also reserved this objective, and proposes to develop a more refined water quality objective that considers food web models developed specifically for the Bay – Delta ecosystem.~~

~~*Selenium in the Regional Setting*~~

~~The current understanding is that the Bay is *possibly* impaired by selenium. Most of the Bay is in attainment of the five ppb water quality objective, but uncertainties remain about risks posed by selenium accumulation in algae, clams, and birds that feed on clams. One of the main reasons the Bay was originally listed as selenium-impaired was due to concentrations in the livers of diving ducks, which were thought to pose a hazard to human consumers. As discussed in (Abu-Saba and Ogle, 2005), some of the assumptions about human dietary intake of selenium may need to be revisited. However, it is known that selenium concentrations in organisms that feed heavily on benthic invertebrates exceed thresholds for reproductive hazards found in other ecosystems with resulting deformities in birds and increased mortality in embryos and chicks, so there is reason for concern about protection of wildlife in the Bay. This concern is primarily focused in the northern reach of the Bay, which is well removed from the Project area, because of historical discharges of selenium from industrial sources that have been abated, and the possibility of increased selenium loads from water management decisions in the Central Valley (Abusaba and Ogle, 2005). Regional concerns over selenium in the Sacramento San Joaquin River Delta are the basis for the USEPA-led interagency technical team which is developing new water quality objectives for selenium. The objectives may, in the future, inform regulatory guidance that applies to South Bay and the Project area. Currently, the only applicable guideline is the five ppb water quality objective in the California Toxics Rule for surface waters, and the 50 micrograms per liter (µg/L) Maximum Contaminant Level (MCL) for drinking water supplies.~~

~~*Selenium near the Project Area*~~

~~Selenium exceeds the 5 µg/L water quality objective in the Project area of Alviso Slough. One possible explanation is the discharge of pumped groundwater from dewatering operations in the lower Guadalupe River. Selenium concentrations exceeded the surface water quality objective (up to eight µg/L) in groundwater wells in the alluvial plain between Coyote Creek and the Guadalupe River Flood Plain~~

~~(SCVWD, 1994). Although these concentrations still are well below the MCL for drinking water (50 μg/L) , they may explain the local exceedances of the surface water quality objective in Alviso Slough. There is presently no evidence for concern over selenium levels in the food web near the Project area.~~

Other Bioaccumulative Pollutants not Considered in this Analysis

Polybrominated diphenyl ethers (PBDEs), polynuclear aromatic hydrocarbons (PAHs), and dioxins and furans were reviewed in this analysis and found to be regional issues that would not be affected by Project activities in a way that would significantly impact beneficial uses of water. Further discussion is provided in Appendix B pp. B-34-36. ~~Polybrominated diphenyl ethers (PBDEs) are an emerging class of chemicals of concern that have recently been identified in San Francisco Bay fish (San Francisco Estuary Institute, 2006). PBDEs are analogous to PCBs in structure, with bromine atoms substituted for chlorines. PBDEs are used as flame retardants. Beyond their accumulation in fish, little is known about the sources, pathways, fate and effects of these compounds.~~

~~Polynuclear aromatic hydrocarbons (PAHs) are a class of compounds derived from either direct petroleum-related spills or indirect combustion of petroleum, coal, coke, and other carbon sources. While they can accumulate in fatty tissues, the biomagnification of PAHs is typically not as large as PCBs and other compounds considered. A few of the many PAH compounds (e.g., benzo-a-pyrene) are known or suspected carcinogens. The PAH compounds that are carcinogenic have much lower water quality objectives established in the California Toxics Rule because of the human health risk factor involved in setting the objective. As a result, many water column samples in the Bay exceed water quality objectives. However, there has not been a robust risk-based analysis comparable to PCBs or legacy organochlorine that supports a finding of impairment based on PAH concentrations in fish. Additional information on PAHs in San Francisco Bay water, sediments, and fish is available through the San Francisco Bay Regional Monitoring Program website at http://www.sfei.org/rmp.~~

~~Dioxins and furans are inadvertent by-products formed during high temperature combustion processes in the presence of chlorine. Like PCBs, these compounds are potent carcinogens that accumulate in fatty tissues. While dioxins and furans have been detected in Bay fish, there are uncertainties about the risk level posed and hence the level of impairment. The current level of knowledge indicates that stormwater is the primary conveyance of dioxins and furans to the Bay, although the most likely source to stormwater is atmospheric deposition. The U.S. EPA has summarized dioxin issues for San Francisco Bay at http://www.epa.gov/region9/water/dioxin/sfbay.html.~~

All of the above bioaccumulative pollutants were reviewed in this analysis, and found to be regional issues that would not be affected by Project activities in a way that would significantly impact beneficial uses of water.

Other toxic pollutants – See Appendix B, pp. B-34-36 for discussion of Trace Metals, copper, and Petroleum Hydrocarbons in the Regional and Project settings.

~~Trace Metals~~

~~In contrast to the bioaccumulative pollutants discussed above, trace metals are of concern because of direct toxicity to aquatic life, rather than accumulation in the food web. The trace metal that has received the most attention in the Bay Area is copper. The mechanism for toxicity for copper involves dissolved~~

~~forms that are available for uptake by one-celled organisms such as algae and the larvae of fish and bivalves. Consequently, water quality objectives for these metals are expressed as dissolved concentrations, i.e., the concentration in water that can pass through a 0.45 micrometer (µm) filter.~~

~~*Copper in the Regional Setting*~~

~~A site specific water quality objective for copper has recently been developed for the far South Bay and adopted by the San Francisco Bay RWQCB (San Francisco Bay RWQCB, 2002). This objective of 6.9 µg/L is attained throughout the far South Bay. Consequently, the far South Bay is not listed as impaired due to copper.~~

~~Copper concentrations in sediments are known to be elevated by about 30 percent compared to pre-historic conditions in the Bay. This is suspected to be a result of runoff from paved streets that contains finely abraded copper from the copper lining of automobile brake pads. Consequently, the site specific objective for copper is coupled to a copper action plan that requires continued monitoring of copper in water and sediments and corrective actions if there is a detected risk of increasing copper concentrations in Bay sediments or water.~~

~~*Copper and other Trace Metals near the Project Area*~~

~~Copper concentrations and processes in Alviso Slough are comparable to the regional setting. Other trace metals of note include nickel, lead, and silver. Naturally occurring serpentine minerals from Franciscan Formation sediments tend to have elevated nickel concentrations (Andersen, 1998). Therefore, naturally occurring nickel concentrations in Bay sediments (approximately 110 ppm) can exceed median effects range (51.6 ppm). This is not considered to be an effect of concern. Lead concentrations in sediments of Alviso Slough are elevated as a result of legacy releases, primarily from leaded gasoline. There are discreet areas known to have elevated soil and sediment lead concentrations (Earth Tech, 2006). In the regional context and the Project setting, trace metals are not impairing beneficial uses. Project activities are not likely to affect trace metals in a way that would significantly impact beneficial uses of water in the future.~~

~~**Petroleum Hydrocarbons**~~

~~Petroleum hydrocarbons typically enter the environment as a result of fuel spills from storage tanks and fueling operations. Exposure to fuel spills can result in larval abnormalities in some aquatic organisms (Singer et al., 1998). Much larger fuel spills can lead to the tarring of larger fauna such as seals, otters, and birds and accumulation in crustaceans, as was seen in the recent Cosco Busan oil spill (impacts of that event did not extend into the Project area). Fuel and oil spills do not occur with any significant frequency in the regional setting of the far south Bay, as oil tanker and other large vessel traffic is confined to the northern and central reaches of the Bay.~~

~~Moderate contamination of total petroleum hydrocarbons (TPH) was identified in soils and sediments near the Project area (Earth Tech, 2006), possibly as a result of previous vessel traffic or storage of abandoned boats in and around the Alviso Marina. The Project will follow mandatory regulatory requirements to develop and implement fuel spill containment plans, and therefore the potential for impacts due to petroleum hydrocarbons as a result of Project activities was not analyzed further.~~

Fisheries Habitat Water Quality Parameters

~~Water quality concerns related to healthy habitat for fish include DO, turbidity, salinity, and temperature. Tidal waters such as the Bay and Alviso Slough are designated in the Bay Basin Plan as cold and warm water fish habitat. For these waters, water quality objectives for DO, turbidity, salinity, and temperature are specified in the Basin Plan. The salt ponds in the greater South Bay and Project area are designated as estuarine habit. The characterization of estuarine habitat in the San Francisco Bay RWQCB Basin Plan recognizes that "Estuarine habitat is generally associated with moderate seasonal fluctuations in DO, pH, and temperature and with a wide range in turbidity."~~

~~*Dissolved Oxygen*~~

~~DO in surface waters is required for aquatic life to breathe Low DO can cause mortality in aquatic and benthic organisms, increased mercury methylation rates, and increased rates of disease such as avian botulism.. The target DO concentration for a healthy ecosystem is dependent on the environment. For the regional area and including Alviso Slough, the Basin Plan sets the DO objective at five milligrams per liter (mg/L) but acknowledges that a three month median concentration of 80 percent oxygen saturation is sufficient to protect beneficial uses of the area. In the adjacent salt ponds and tidal marsh, lower DO concentrations are a natural occurrence. Oxygen is consumed by chemical and biological processes. Factors typically leading to oxygen depletion in estuarine environments are increased phytoplankton growth, low flow rates and low mixing.(see for example, the SBSP Restoration Project Nutrient and Contaminant Analysis Report [Brown and Caldwell 2006]).~~

~~*Dissolved Oxygen in the Regional Setting*~~

~~The Regional Monitoring Program measures DO in the water samples collected from the Estuary. In the 1996 to 2003 dataset, DO in the Lower South Bay ranged from 4.30 to 10.00 mg/L, with 96 percent of measurements equal to or greater than the water quality objective of five mg/L. The measurements in the southern sloughs ranged from 0.43 to 12.18 mg/L with 78 percent of measurements equal to or greater than five mg/L. During the period 1997 – 2001, 13 measurements of DO were made in the surface water of Alviso Slough at the dock of the Alviso Yacht Club (San Francisco Estuary Institute, 2002). All of these measurements were above five mg/L.~~

~~*Dissolved Oxygen in Salt Ponds Adjacent to the Project Area*~~

~~USGS measured DO in Alviso Ponds A8 and A12 during monthly sampling from 2002 to 2006. The majority of measurements ranged from 4 to 10 mg/L. While some measurements were below concentrations considered healthy for aquatic life, the proposed changes to Pond A8 and actions under the Adaptive Management Plan for the SBSP Restoration Project are expected to improve DO in the salt ponds and mitigate potential adverse effects on Alviso Slough, as discussed later in this section. Currently available monitoring data indicate healthy DO levels in the Project area.~~

~~*Turbidity*~~

~~Turbidity is a measure of the clarity of the water. Low turbidity measurements indicate clear water. Suspended sediments can cloud the water, making it difficult for fish to see their prey and can impair their respiration. Unstable stream banks and discharges from upstream activities such as construction grading can lead to increased suspended sediments, and therefore increased turbidity, in the water. Natural mixing~~

~~from river flows and tides can also increase the turbidity of the water. There is presently no evidence for turbidity impairment in the Project area.~~

~~*Salinity*~~

~~Salinity is a water quality concern as it relates to aquatic species health. Different salinity concentrations support different species in the Estuary. Salinity discussion is presented in Section 3.1 Hydrology.~~

~~*Temperature*~~

~~Temperature in the Regional Setting~~

~~Temperature data collected by the RMP sampling in the lower South Bay and South Bay sloughs ranges from 8 to 25 degrees Celsius (deg. C) (San Francisco Estuary Institute, 2002). The median temperature is 19 deg. C. Water temperature is expected to vary seasonally with ambient air temperature and changes in tides and freshwater inflows.~~

~~Temperature in Salt Ponds Adjacent to the Project Area~~

~~USGS collected temperature data from Alviso Ponds A8 and A12 during monthly sampling from 2002 to 2006. Temperatures in both ponds ranged from about 10 to 28 deg. C with the lowest temperatures in December and the highest in July (Takekawa et al., 2005). Typical temperature conditions in Pond A8 will change if the pond is opened to tidal action and the average water depth is increased as planned under the SBSP Restoration Project (Phillip Williams and Associates, 2006). Temperature is not considered to be a water quality parameter that needs to be analyzed for potential impacts. Alviso Slough Restoration Project activities will not increase solar heating or other processes that affect temperature.~~

Aesthetics – See Appendix B, pp. 37-38

Aesthetic concerns related to water and sediment quality in the Alviso area include trash, phytoplankton, and odors in the regional and project settings. ~~It is important to consider aesthetics of water and sediment quality when evaluating project alternatives to help ensure the project objective of improved recreation and tourism opportunities is met.~~

~~*Trash*~~

~~Trash is introduced to the watershed by people littering directly near the water and indirectly through stormwater flows. Stormwater runoff can carry litter from parking lots, roads, and adjacent areas to creeks and sloughs via overland flow and stormwater drains.~~

~~*Trash in the Regional Setting*~~

~~The District participates in the Creek Connections Action Group which sponsors two volunteer creek cleanup days a year in Santa Clara County. On National River Cleanup Day in May 2006 volunteers removed more than 12,500 pounds of trash and recyclables from creeks in Santa Clara County (http://www.cleanacreek.org/nrcresults2006.htm). On Coastal Cleanup Day in September 2006 volunteers removed another 22,464 pounds of trash and 5,503 pounds of recyclables from creeks in Santa Clara County (http://cleanacreek.org/ccdresults2006.htm). The District also sponsors an Adopt-A-Creek program where volunteers help preserve the health and beauty of local creeks year-round. As noted in the regulatory discussion above, TMDLs to manage and control the amount of trash reaching Guadalupe River and Coyote Creek will likely be developed during the time span of the Alviso Slough Restoration~~

~~Project. The eastern, urbanized portion of the reach of the slough through the Project area was adopted by the SBYC in the District Adopt-A-Creek program. Public awareness projects tend to reduce illegal discharge and dumping.~~

No data is currently available to determine whether trash is a problem at the Project site. However, because trash is a general problem in urbanized watersheds, the issue is presented here.

~~**Phytoplankton**~~

~~Phytoplankton are the unicellular species at the base of the food chain, often referred to as algae. Phytoplankton grow through photosynthesis, converting light energy and nutrients to cell mass, and die naturally and through predation by zooplankton in the water column and mollusks and other benthic feeders in the sediment. Excessive phytoplankton growth and subsequent die-off can lead to low DO concentrations in the water column, adversely affecting fish and wildlife. Noxious odors may also result from excessive phytoplankton in surface waters. The main factors controlling phytoplankton growth are light and nutrient availability. Further information on phytoplankton growth and its effects on DO are documented in the Nutrient and Contaminant Analysis Report prepared by Brown and Caldwell for the SBSP Restoration Project (Brown and Caldwell, 2006).~~

~~*Phytoplankton in the Regional Setting*~~

~~In San Francisco Bay, phytoplankton growth was historically limited to relatively low growth throughout the year with the exception of a period of rapid growth, or bloom, in the spring. Since the late 1990's, phytoplankton growth in the Bay has increased including larger spring blooms, new autumn-winter blooms, and increased baseline phytoplankton levels throughout the year (SFEI 2006 Pulse of the Estuary). The exact cause for this increase in phytoplankton in the Bay is not known. Various hypotheses and more information on the phytoplankton changes are presented in San Francisco Estuary Institute's 2006 Pulse of the Estuary.~~

~~*Phytoplankton in Salt Ponds Adjacent to the Project Area*~~

~~Within the Project area, the areas of concern for potential phytoplankton nuisance are Ponds A8 and A12 of the Alviso Salt pond complex in the SBSP Restoration Project boundaries. Nuisance phytoplankton growth leading to low DO conditions has been documented under current operations of the salt ponds guided by the Interim Stewardship Plan (ISP update august 2005). Problems in the Alviso area occurred in Ponds A3W, A7, A14 and A16. The SBSP Restoration Project includes plans to open Pond A8 to tidal action, lowering the risk of nuisance algae growth in those ponds (PWA et al 2006, SBSP Final Alternatives Report).~~ Algal blooms and low DO in ponds do not currently affect the Project area, because the ponds are not currently directly connected to the Project area. There is presently no evidence for problematic phytoplankton blooms in the Project area.

3.2.3 Environmental Impacts and Mitigation

~~Overview~~

To evaluate the potential for impacts, thresholds of significant impacts for water quality factors that could be affected by the Project are summarized below. The thresholds are primarily based on the ~~state's program of Water Quality Standards, as~~ Basin Plan and TMDLs described in the Regulatory Setting (Section 3.2.1). ~~Based on information that is summarized in the Physical Setting (Section 3.2.2) and~~

~~presented in more detail in Appendix B, and the descriptions of the Project alternatives, the potential to exceed thresholds of significance for each impact is evaluated and summarized below.~~ Under each potential impact, the likelihood of occurrence and potential for mitigation are discussed.

Significance Criteria

Thresholds of significance are used to define whether significant environmental impacts would be expected as a result of the project. In general, thresholds should be objective, quantitative wherever reasonably possible, and based on existing standards wherever possible. These thresholds are shown in Table 3.2-4 (further information on water quality objectives is provided in Appendix B, Tables B-2, B-3, and B-4). ~~Following those guidelines, the relevant water quality objectives shown in Appendix B are used for this analysis.~~

Some of the water quality objectives are narrative, rather than numeric. In those situations, translations to numeric endpoints are necessary using the best available science. In some cases (e.g., PCBs, selenium), the translation from the narrative relies on technical summaries completed as part of emerging regulatory programs. ~~In other cases (e.g., salinity, floatables, settleable solids) the translation from the narrative objective relies on best professional judgment.~~

Table 3.2-4 Current water quality objectives for mercury, DO, Chlordanes and DDTs in the regional setting and the project setting

Current Total Mercury Water Quality Objectives in San Francisco Bay		
North of Dumbarton Bridge	0.025 ug/L 4-day average in water	Basin Plan
-	2.1 µg/L 1-hour average in water	Basin Plan
South of Dumbarton Bridge	0.051 µg/L 30-day average in water	California Toxics Rule
Other Surface Water Criteria		
DO	5 mg/L[b]	Basin Plan
Chlordanes	2.2 mg/L[c]	Basin Plan
DDTs	0.59 ng/L[c]	Basin Plan

Notes:

a. The current Basin Plan objectives listed above are applicable in marine waters – those in which the salinity is equal to or greater than 10 parts per thousand 95 percent of the time. For waters in which the salinity is between fresh and marine, that is between 1 and 10 parts per thousand, the applicable objectives are the more stringent of the freshwater or marine objectives. For mercury, the marine objectives are more stringent.

b. CRWQCB, SF Bay Region, Water Quality Control Plan, San Francisco Bay Basin Electronic Basin Plan, September 13, 2005. Surface waters greater than 10 ppt salinity.

c. 40 CFR Part 131.38 (Calfiornia Toxics Rule or CTR), May 18, 2000.

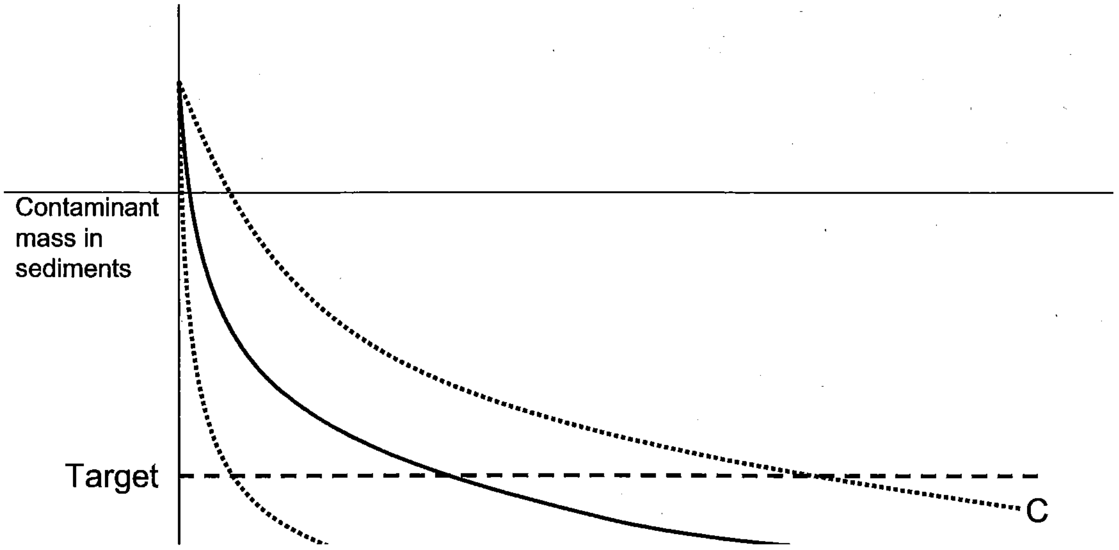
Threshold for Localized, Seasonal Low DO Levels

The threshold for low DO levels is established by the Basin Plan Water quality objective for DO, which is ~~five~~ 5.0 mg/L DO or greater for tidal waters, although the objective acknowledges that attaining 80 percent oxygen saturation as a three-month median is satisfactory for protection of beneficial uses. Since low DO naturally occurs in estuarine settings, the threshold for impacts is failure to attain the numeric objectives accompanied by undesirable effects.

Mobilization and Transport of Mercury-Contaminated Sediments

In the regional setting, the threshold for significant impacts for total mercury concentrations in sediments is established by the proposed San Francisco Bay mercury TMDL. That TMDL includes a proposed target for mercury in suspended sediments of 0.2 ppm, computed as the annual median of RMP monitoring results. The Bay is currently over this target, which is in part why a TMDL for mercury will be implemented.

Contaminant concentrations in sediments are translated to the mass inventory in sediments of the actively resuspended layer, nominally the upper 10 centimeters. The goal is to reduce the current mass of mercury in the actively resuspended layer of sediments throughout the Bay. Mercury watershed load reductions have already been achieved over the past three decades, and thus the mercury mass is slowly declining towards the target mass ~~(see Figure 3.2-3, Curve A). The threshold for impacts due to mobilization and transport of mercury-contaminated sediments is Curve A, which represents the conceptual rate of decline of the mercury mass at existing conditions. A significant impact would occur if any slowdown in the rate of decline of the mercury mass occurs compared to no project conditions. In other words, if project activities were to result in a rate of decline from Curve A towards Curve C, the threshold would be exceeded and the impact would be considered significant because the timeline to achieve the target would be extended. Conversely, an environmental benefit would result from activities that accelerate the rate of decline towards the target mass (i.e., if the rate of decline were to proceed from Curve A toward Curve B) Curve B). The potential for positive or negative impacts can be assessed by evaluating the mercury mass removed or mobilized into the Bay, and comparing it to existing masses (Curve A) in the Bay~~.



~~**Figure 3.2-3 Conceptual illustration of the mass-based assessment of the recovery of San Francisco Bay sediments**~~

~~Note: There is an existing mass of sediment-associated contaminants that is slowly declining over time (Curve A). The threshold for impacts is any net change in the current rate of decline. If project activities result in a slower decline (i.e., any delay in the~~

~~attainment of the target mass as represented by Curve C), then the impact would be considered significant. An environmental benefit would result if the decline were accelerated (as represented by Curve B). The conceptual illustration is based on the contaminant models published by Abu-Saba and Tang (2000) and Davis (2004).~~

Increased Methylmercury Production and Bioaccumulation

The Project would have significant impacts to both the regional and the project setting if Project actions resulted in water quality conditions that caused exceedance of tissue-based mercury water quality objectives proposed in the San Francisco Bay mercury TMDL: 0.2 mg/kg in larger fish that people eat, 0.03 mg/kg in smaller fish, and for bird eggs, 0.5 mg mercury per kg bird egg (fresh wet weight), applied to the endangered least tern. Many areas of the Bay are already over these tissue-based targets. Bird eggs and fish have not been specifically collected in Alviso Slough for assessment. The South Baylands Mercury Project has collected fish from the Project area that exceed the targets for small and large fish (Grenier et al., 2007). For the purposes of this analysis, the Project would have significant impacts if activities would result in any increase in concentrations of mercury in fish and bird eggs above background level.

The proposed water quality objectives adopted through the RWQCB's formal administrative process are related to the narrative objective for bioaccumulation cited in the Regulatory Setting:

> Many pollutants can accumulate on particles, in sediment, or bioaccumulate in fish and other aquatic organisms. Controllable water quality factors shall not cause a detrimental increase [emphasis added] in concentrations of toxic substances found in bottom sediments or aquatic life. Effects on aquatic organisms, wildlife, and human health will be considered.

This objective is also a threshold for significant impacts.~~, and should be assessed through the use of sentinel species currently being developed by the South Baylands Mercury Project~~. For the purposes of analysis, a detrimental increase is any net increase above existing conditions (as targets have been exceeded). At present, the accepted indicators for a detrimental increase proposed by the San Francisco Bay Mercury TMDL are the fish tissue and bird egg targets cited above.

Mobilization and Transport of Other Contaminants

For all other contaminants, the thresholds for significant impacts are the ~~Water Quality Objectives for~~ water quality objectives of San Francisco Bay, as discussed in the regulatory setting. Project activities that would cause an exceedance of these water quality objectives are deemed to have significant impacts.

~~PCBs are expected to be managed using a mass-based strategy under the TMDL that also relates target concentrations in sediments to a target mass inventory. Therefore, as is the case with mercury, positive or negative impacts are evaluated by the effect on the rate of decline of the PCB mass in the actively resuspended layer of Bay sediments (See Figure 3.2-3).~~

Impacts & Mitigation

The impacts analysis in this ~~Draft~~ Final EIR evaluates five action alternatives and the required No Project alternative. The action alternatives include vegetation removal and/or dredging, as described in Chapter 2. Under the No Project alternative, the District would not take any action in the Project area and existing programs would continue. The analysis covers impacts from the construction and maintenance phases–both in the slough and at staging areas.

All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by BCDC, CSLC, the District, or SBYC by the time of commencement of construction of this Project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Table 3.2-~~3~~5 lists each impact identified for the proposed alternatives, along with the significance of each impact. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (less than significant and does not require mitigation), or Class IV (beneficial). Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections.

~~Table 3.2-4 lists each beneficial use in the Project area and the effects of each alternative on that beneficial use. An equal sign designates no effect, a plus sign a net beneficial effect, and a minus sign a negative effect. Benefits generally occur to the recreational beneficial uses and where dredging alternatives would remove a mass of contaminants which are impairing the beneficial use. While navigation within the slough is benefited by the action alternatives, the navigation beneficial use is not because it is by definition larger scale navigation including shipping and transportation.~~

No Project Alternative

Under the No Project Alternative, there would be no negative impacts, nor any benefits. The potential for localized low DO concentrations would remain as it is currently. Mobilization and transport of mercury and PCBs would not occur at a rate faster than under current conditions of erosion, deposition, and tidal mixing of suspended sediments. Vegetation root mass removal would not take place, and therefore the methylation and bioaccumulation of mercury would remain essentially the same.

Table 3.2-~~3~~5 Impact and Mitigation Summary

Impact	Impact Significance	Mitigation Measures
Impact WQ-1: Potential to cause localized low DO levels.	Alts. 1-5: Class III	--
	~~Alt. 6: No Impact~~	—
Impact WQ-2: Potential to mobilize, transport, and deposit mercury-contaminated sediments.	Alts. 1-2: Class III	--
	Alts 3-5: Class ~~IV~~II	WQ-A WQ-B
	~~Alt. 6: No Impact~~	—
Impact WQ-3: Potential to increase net methylmercury production and bioaccumulation in the food web.	Alts. 1-5: Class ~~III~~I	WQ-C TERRBIO-B
	~~Alt. 6: No Impact~~	—
Impact WQ-4: Potential to mobilize, transport, and deposit PCBs and organochlorine pesticides.	Alts. 1-2: Class III	~~WQ-A~~
	Alts. 3-5: Class ~~IV~~II	WQ-A WQ-B

Table 3.2-~~3~~5 Impact and Mitigation Summary

Impact	Impact Significance	Mitigation Measures
	~~Alt. 6: No Impact~~	—
Impact WQ-5: Potential impacts to water quality as a result of increased illegal discharges and dumping.	Alts. 1-5: Class IV	--
	~~Alt. 6: No Impact~~	—
Impact WQ-6 Potential for surface water contamination of groundwater.	Alts. 1-5: No Impact	--
	~~Alt. 6: No Impact~~	—
Impact WQ-7 Impacts from removal of navigational hazards.	Alts. 1-5: Class IV	--
	~~Alt. 6: No Impact~~	—
Impact WQ-8 Impacts from drying and rehandling removed sediment and/or vegetation.	Alts. 1-5: Class III	--
	~~Alt. 6: No Impact~~	—
Note: The impacts and mitigation would be the same both with and without the SBSP Restoration Project.		

Impact WQ-1: Potential to cause localized low DO levels.

Summary - Common to all Alternatives

Vegetation root mass removal and dredging would resuspend settled biomass and organic matter from the slough bottom into the water column as the banks and bottom surface are disturbed. The resuspended materials can be oxidized and metabolized in chemical reactions and biological processes which would consume oxygen in the water column, leading to localized low DO levels in the slough. As discussed in Section 2.3.1 (Chapter 2 of this EIR), a turbidity screen would be placed around the vegetation removal and dredging areas to contain any resuspended bottom material and floating debris. Use of flocculants may also contain resuspended material. The resuspended materials are expected to settle again without traveling far. This resuspension of bottom sediment materials is not a long-term impact of the project but an immediate result of restoration activities.

Alternatives 1, 2, 3, 4, and 5

Alternatives 1 through 5 include vegetation and root mass removal; Alternatives 3 through 5 also include dredging. As discussed above these activities disturb the bank and bottom sediments resulting in resuspension of some materials with biological and chemical oxygen demands. Reactions within the oxygenated water column may result in localized low DO levels as the water column oxygen is consumed. Tidal exchange and wind mixing would tend to offset the consumption of DO soon after proposed activities have stopped. Turbidity screens placed around the vegetation removal and dredging areas, plus the use of flocculants, may ~~would~~ prevent floating and suspended materials from traveling downstream.

~~Table 3.2-4 Alternative Effects on Beneficial Uses~~

~~Beneficial Use~~	~~Primary Contaminants of Concerns~~	~~Alt. 1~~	~~Alt. 2~~	~~Alt. 3~~	~~Alt. 4~~	Alt. 5	Alt. 6
~~Industrial Service Supply~~	~~none~~	=	=	=	=	=	=
~~Commercial and~~	~~Methylmercury, PCBs,~~	=	=	~~+~~	~~+~~	+	=

~~Sport Fishing~~	~~legacy organochlorines~~						
~~Shellfish Harvesting~~	~~Bacteria/Pathogens~~	=	=	=	=	=	=
~~Estuarine Habitat~~	~~Salinity, Fill~~	=	=	=	=	=	=
~~Fish Migration~~	~~Temperature~~	=	=	=	=	=	=
~~Preservation of Rare and Endangered Species~~	~~Methylmercury, PCBs, legacy organochlorines~~	=	=	~~+~~	~~+~~	+	=
~~Spawning/Fish Reproduction~~	~~Dissolved Oxygen, Sediment, Temperature~~	=	=	=	=	=	=
~~Wildlife Habitat~~	~~Methylmercury, PCBs, legacy organochlorines~~	=	=	~~+~~	~~+~~	+	=
~~Water Contact Recreation~~	~~Bacteria/Pathogens, Algae, sediment~~	~~+~~	~~+~~	~~+~~	~~+~~	+	=
~~Non-contact Recreation~~	~~Trash, boats, other eyesores~~	~~+~~	~~+~~	~~+~~	~~+~~	+	=
~~Navigation~~	~~Sediment~~	=	=	=	=	=	=
~~Note: "—" designates no effect; "+" designates a net beneficial effect; " " designates a negative effect.~~							

Alternatives 1 through 5 would result in localized, short-duration, low DO levels due to increased oxygen demands in the water column. Tidal exchange and wind-driven mixing is expected to offset the depletion of oxygen. Because DO is constantly replenished, alternatives that remove relatively greater amounts of vegetation and / or dredge relatively greater sediment volumes would still have roughly the same effect on DO as alternatives with lesser similar activities because the construction activities would proceed at similar rates. The cycle of short-term depletion and replenishment by wind and tidal action would simply ~~go on~~ extend longer for the more extensive removal and dredging activities that take longer to complete. This impact is considered **Less than Significant**.

~~Alternative 6: No Project~~

~~Alternative 6 would not result in any disturbance to the sediments that would result in localized, low DO levels. As existing DO levels would be continued, this is considered **No Impact**.~~

Impact WQ-2: **Potential to mobilize, transport, and deposit mercury-contaminated sediments.**

Summary - Common to all Alternatives

~~Both v~~Vegetation root mass removal ~~and dredging would~~ will resuspend sediments as a result of the activity. This is a short term effect that can be mitigated through the use of silt fences during vegetation removal ~~the disturbance. While dredging would expose deeper~~ Dredging also has the short-term effect of mobilizing sediments. As discussed in the Physical Setting section above, sediment cores analyzed Bayward of the Project Area have relatively consistent total~~, the~~ mercury concentrations over the depths characterized (six feet). However, cores have not been collected within the Project Area, and dredging activities may mobilize sediments ~~of which are not known, the sediments left exposed are not expected to be transported out of the immediate area. Once dredged, the slough bottom would be~~ deeper than six feet. Thus a conservative approach presumes that ~~the steady state equilibrium depth and new sediments would be deposited, covering the deeper sediments initially exposed. The newly deposited sediments would have ambient~~ mercury could be exposed that is similar to the concentrations ~~comparable to the existing~~ found in nearby areas of the slough. Sediment testing will be necessary prior to, and during dredging, to determine whether mercury concentrations located in deeper sediments within the Project areas are significantly higher than surface sediments and to carry out mitigation measures (see WQ-4) needed to reduce to less than significant levels as well as to establish spoil disposal options (see discussion on sediment reuse below), which are a mixture of sediment from South Bay and upstream watershed sources.

Alternatives 1 and 2

Alternatives 1 and 2 do not include dredging. Alternative 1 calls for vegetation removal over 2.6 acres and Alternative 2 calls for vegetation removal over seven acres. As discussed in the impact summary above, vegetation and root mass removal may result in immediate, short-duration exposure of near-surface sediments in the construction area. Surficial sediments disturbed by vegetation removal are expected to have total mercury concentrations comparable to surficial sediments in the South San Francisco Bay. Use of the turbidity screen would limit the area of exposure and the sediments are expected to settle quickly. ~~Surficial sediments disturbed by vegetation removal are expected to have total mercury concentrations comparable to ambient sediments in the Project area.~~

~~Alternatives 1 and 2~~

Alternatives 1 and 2 would result in short-duration exposure of surficial sediments in the construction areas. These sediments are expected to settle quickly and will be covered by cleaner sediment from upstream sources within a few days of project completion. ~~have mercury concentrations that are comparable to surficial sediments of South San Francisco Bay.~~ This impact is considered **Less than Significant.**

Alternatives 3, 4 and 5

Alternative 3 includes approximately 3.7 acres of vegetation and root mass removal and dredging to a depth of eight feet depth along the east bank of the current slough channel. Alternative 4 includes 6.2 acres of vegetation removal and deep dredging to 16 feet depth and Alternative 5 includes 15.3 acres of vegetation removal and 9.7 acres of dredging to 10 feet depth.

As discussed above for all alternatives, both vegetation root mass removal and dredging would create short term resuspension of sediments which are expected to settle quickly. ~~Lateral transport of the suspended sediment would be contained within the Project area with silt fencing.~~ Dredging would leave deeper sediments exposed. These sediments are not expected to be transported out of the Project area because the equilibrium bed depth of the Slough is higher than the proposed dredged depths. Therefore, ambient sediments carried in by the tide would be deposited at slack tide and cover the sediments exposed by dredging.

The San Francisco Bay Mercury TMDL has set a goal of reducing mercury concentrations in Bay sediments to about 50 percent of their current concentrations, approximately 0.2 ppm. ~~Preliminary information from the South Baylands Mercury Project indicates that sediments of Alviso Slough are two to five-fold higher than this goal. While there may be a slight increase with depth, the increase is not statistically significant. Table 3.2-5 shows the mass of mercury that would be removed permanently from the Basin by dredging for Alternatives 3, 4, and 5. The total mass of mercury in the active layer of the Bay and the Far South Bay are provided for comparison. Implementation of the dredging associated with~~

~~these alternatives would remove from 16 to 84 kg of mercury from the system. The result is a small amount of mercury that would be resuspended during project activities compared to a large amount that would be permanently removed. This removal would be considered a net benefit to the environment and in particular the beneficial uses impaired by mercury, including sport fishing and fish and wildlife habitat. Project removal of mercury mass would accelerate the attainment of the target mass of mercury proposed by the TMDL. In Figure 3.2-3, this would be characterized as the movement from Curve A (the existing condition) towards Curve B. However, there is insufficient information at present to quantify the level of timeline acceleration between Curve A and Curve B; all that is known is that removing contaminant mass will speed up the attainment of the target mass . Because the rate of decline would be accelerated, Project impact would be **Beneficial**.~~

The preliminary results of the South Baylands Mercury Project sediment cores showed that sediments have relatively homogeneous total mercury concentrations to depths of six feet. Cores were not extended to the proposed dredging depths, 8, 10, and 16 feet, but concentrations are expected to be similar to those at 6 feet depth. If sediment samples collected during dredging indicate sediment concentrations of mercury are greater than ambient mercury concentrations in South Bay sediments, deeper dredging to remove the contaminated sediments would support the Mercury TMDL goals. Deeper dredging alternatives can result in the channel being dredged to a depth below the equilibrium depth of the channel expected to be sustained by tidal scour, causing sediments with Bay-ambient contaminant concentrations to deposit in tidal flows. The effect is first to reduce the potential redistribution of the sediments from the dredge site, in effect, resulting in no net transport of newly exposed contaminated sediment. Second, a deeper dredge could promote deposition of off-site sediment onto the dredge site unrelated to tidal and stream flows.

Alternatives 3, 4, and 5 would likely result in remobilization and exposure of sediments contaminated with mercury. The magnitude of the impact depends on the vertical profiles of mercury in sediments within the construction area. If vertical profiles of sediment cores are comparable to cores assessed by the South Baylands Mercury Project, then the overall impact of dredging on the total mercury concentration in South Bay sediments would be **Less than Significant with Mitigation** after implementation of mitigation WQ-A.

Mitigation Measure WQ-A: Drill cores and analyze sediment samples in the construction area to determine sediment disposal or reuse options and the resulting contaminant concentrations in sediments exposed by dredging and vegetation removal.

- Sediment cores will be drilled and samples will be collected and analyzed to determine the concentrations of mercury, PCB's and organochlorine pesticides in sediments at various depths and to characterize the sediment for disposal and that will be exposed at the dredged channel bottom.
- Over-dredging of sediments may be considered if the contaminant levels below the proposed dredging depth are significantly higher than those in the sediments to be removed and where deemed beneficial to Mercury or PCB TMDL goals.
- Sediments will be disposed upland or re-used in wetland foundations (non-cover) according to LTMS guidelines, based on the results of sample analysis.

This mitigation measure could result in less than significant impacts, and possibly net benefits, with respect to mass-based strategies for managing mercury and other sediment-associated pollutants. Table 3.2-6 shows the mass of mercury that could be removed permanently from the Basin by dredging under Alternatives 3, 4, and 5. The total mass of mercury in the active layer of the Bay and the Far South Bay are provided for comparison. Implementation of the dredging associated with these alternatives could remove from 16 to 84 kg of mercury from the system. Project removal of mercury mass could accelerate the attainment of the target mass of mercury proposed by the TMDL.

> **Mitigation Measure WQ-B: Choose methods of dredging that minimize dispersion of suspended sediments.** Hydraulic, as opposed to mechanical, dredging will reduce turbidity and dispersal of sediments mobilized by dredging activities. The dredging permit applications will also propose to include mitigation measures such as turbidity screens and use of flocculants (e.g., polyacilamide) to reduce sediment dispersal.

Table 3.2-~~5~~6 Comparison of contaminant masses in the upper 10 cm of the entire Bay and far South Bay with contaminant masses removed by dredging alternatives

	All Bay (upper 10 cm)	Far South Bay (upper 10 cm)	48,000 Yd^3 Wet Sediment (Alternative 3)	160,000 Yd^3 Wet Sediment (Alternatives 4 and 5)
Mass Hg (kg)	44,000 - 64,000	600 - 1,300	16 - 25	52 - 84
Mass PCBs (kg)	1,200 - 2,900	40 – 90	2 - 3	5 - 12
Mass DDT (kg)	250 - 1,100	10 – 40	0.6 - 1.0	2 - 3
Mass Chlordane (kg)	62 - 143	0.6 – 11	0.1 - 0.3	0.3 - 1.0
Note: Detailed calculations appear in Appendix B				

~~Alternatives 3, 4, and 5 would result in short-duration exposure of surficial sediments in the vegetation removal construction areas and deeper sediments in the dredging areas. The surficial sediments are expected to have mercury concentrations that are comparable to surficial sediments of South San Francisco Bay. The deeper sediments are expected to be covered with Bay ambient sediment as the slough bed accretes. Dredging would remove from 16 to 84 kg from the system, preventing its mobilization to the Bay and advancing the recovery of the Bay from mercury associated impairment. Therefore, this impact is considered **Beneficial.**~~

~~Alternative 6: No Project~~

~~Alternative 6 would not result in increased exposure or transport of contaminated sediments. Existing mercury would remain in place without change. The benefits of removing contaminated sediments from the slough in the dredging alternatives would also not occur under Alternative 6. This is considered **No Impact.**~~

Impact WQ-3: **Potential to increase net methylmercury production and bioaccumulation in the food web.**

Summary - Common to all Alternatives

The primary factor with respect to project activities and their effect on net methylmercury production and bioaccumulation in the food web appears to be reactive mercury concentrations. The preliminary findings of the South Baylands Mercury Project indicate that mercury near the surface (i.e., upper six inches of sediment) is much more reactive than mercury at depth (i.e., below 6 – 12 inches). Therefore, even though total mercury concentrations at depth are comparable to those at the surface, activities that bring deeper sediments to the surface could increase the amount of reactive mercury in those deeper sediments~~. It is not known for certain that this increase in reactive mercury would result in an increase in the methylation rate.~~, causing a transient increase in the production of methylmercury. The duration of the increased methylmercury production is difficult to predict, i.e., it is unknown whether equilibrium comparable to pre-project conditions would take weeks, months, or years.

Mechanical vegetation removal by rotovation will remove root mass to a depth of 4 feet, with only minimal removal of sediment. Vegetation removal has been shown to reduce net methylation rates. This would be countered by short-term increases in the amount of reactive mecury available for methylation.

There are several links in the chain of cause and effect between increases in available mercury to increases in mercury in the food web. With each link, the certainty of an effect decreases. Based on the findings of the South Baylands Mercury Project ~~Study~~, it is highly probable that vegetation removal or dredging will increase available mercury. Based on that probability, it is likely, but less certain, that the increase in available mercury would lead to a transient increase in net methylmercury production. Should an increase in net methylation occur, it is possible, but again, not certain, that a significant increase in mercury bioaccumulation would occur. To be conservative, given the uncertainties, it is assumed that disturbance due to vegetation removal or dredging will cause a potentially significant increase in mercury bioaccumulation. ~~possible that dredging would increase available mercury. However, net mercury methylation is a product of mercury availability and mercury methylation rates. A concurrent finding discussed in coordination meetings with the South Baylands Mercury project is that removing vegetation root mass density decreases mercury methylation rates by reducing bacterial activity (Windham-Myers and Marvin-Dipasquale, 2007). Therefore, under all project alternatives, any disturbance that leads to a transient increase in mercury availability is predicted to be offset by a decrease in methylation rates in the Project area. As described above, mercury concentrations in fish from the project area are known to exceed targets set by the TMDL. The net decrease in methylation rates would ensure that mercury concentrations in fish and bird egg would not increase. As such, the project would have~~ ~~**Less than Significant**~~ ~~impacts on net mercury methylation.~~

Transient increases in methylmercury production after ecosystem disturbance are known to occur in other contexts, such as forest fires and newly flooded reservoirs. The key uncertainty that needs to be addressed through post-project monitoring is the duration of this perturbation in the dredging scenarios. Mitigation of any potential increase of mercury in the food web has to address the receptors: people and wildlife that eat fish and other protein sources from the Bay. Mitigations are available that address both of these receptors. People can be educated about the current, pre-project risks associated with mercury in fish caught from San Francisco Bay, what those risks mean for consumption habits, and how any post-project changes detected in mercury concentrations in sentinel species and changes in consumption guidance. Wildlife, in contrast, will forage for fish and other organisms as available. If there is a detectable increase in the mercury concentrations of bird eggs above the threshold for significance, this can only be mitigated at the population level over a longer term by restoring foraging habitat. Therefore, if there is an impact, the available mitigations are not sufficient to bring this impact below the threshold of significance.

Alternatives 1 and~~,~~ 2~~, 3, 4, and 5~~

Alternatives 1 and 2 ~~through 5~~ do not include dredging, Alternative 1 calls for vegetation ~~and root mass~~ removal over 2.6 acres and Alternative 2 calls for vegetation removal over 7 acres. ~~and, for Alternatives 3, 4, and 5, dredging.~~ Vegetation and root mass removal ~~and dredging~~ may result in immediate, short-duration exposure of sediments in the construction area. Use of the turbidity screen would limit the area of exposure and the sediments are expected to settle quickly. Surficial sediments disturbed by vegetation removal are expected to have total mercury concentrations comparable to ambient sediments in the Project area. ~~Deeper sediments exposed by dredging may have similar or higher concentrations of total mercury. The~~ This is much less of a perturbation than dredging, in that deeper sediments ~~would not~~ will remain ~~exposed~~ deep. However, as noted above, there ~~sediment deposition during slack water would cover them. There~~ may be some transient increase in the amount of reactive mercury. ~~as currently buried sediments are brought to the surface. The effects of a potential increase in reactive mercury on methylmercury production are expected to be transient and offset by the reduction in methylmercury production by the removal of vegetation and root mass and the associated bacteria that induce methylation.~~ This impact is considered ~~**Less than**~~ **Significant** after implementation of the mitigation WQ-C and TERRBIO-B (See Section 3.4.3 for a detailed description of TERRBIO-B). However, because Alternatives 1 and 2 do not include dredging, the extent of the impact (e.g., the duration of the temporary perturbation) is expected to be less under these alternatives compared to Alternatives 3, 4, and 5.

Alternatives 3, 4 and 5

Alternative 3 includes approximately 3.7 acres of vegetation and root mass removal, and dredging to 8 feet depth along the banks of the current slough channel. Alternative No. 4 includes 6.2 acres of vegetation removal and deep dredging to 16 feet depth, and Alternative No. 5 includes 15.3 acres of vegetation removal and 9.7 acres of dredging to 10 feet depth. Dredging has the potential to perturb the system, bringing deeper sediments that have lower fractions of reactive mercury to the surface, where the fraction of reactive mercury can increase.

However, this potentially significant impact would be cumulatively significant for all dredging and in-Bay disposal activities around the South Bay, since they all involve bringing deeper sediments to the surface. This helps put the expected magnitude and duration of this project activities in the context of Baywide dredged sediment management and disposal. The Alviso Slough Restoration Project is simply one of the first such projects to consider the findings of the South Baylands Mercury Project.

The mechanism underlying this impact is movement of sediments with relatively consistent mercury concentrations from deeper areas up to the sediment water interface, causing a sudden increase in the fraction of reactive mercury present in the sediments. The preliminary findings of the first year of the South Baylands Mercury Project indicate that the increase in reactive mercury with mobilization is likely a far more significant factor on net mercury methylation than any vertical differences in mercury concentration observed thus far. Because of this, the magnitude of the impact for the alternatives that include dredging is related more to the area of dredging than the depth of dredging.

Alternatives 3, 4, and 5 would result in exposure of deeper sediments with lower fractions of reactive mercury to surface conditions where the fraction of reactive mercury tends to increase, potentially causing a perturbation and increase in net methylmercury production and bioaccumulation. Based on the areas to be dredged, the relative magnitude of the impact would be the least for Alternative 3, greatest for Alternative 5, and intermediate for Alternative 4. This impact is considered **Significant** after implementation of the mitigation WQ-C and TERRBIO-B (See Section 3.4.3 for a detailed description of TERRBIO-B).

Mitigation Measure WQ-C: Coordinate with the South Bay Salt Pond Restoration and San Francisco Bay Mercury TMDL efforts to communicate information to the public regarding Mercury effects.

To understand any possible increases in methylmercury production resulting from the project, studies will be conducted to support adaptive management strategies. Monitoring results will be provided to the SFRWQCB and used to improve the effectiveness of future maintenance and restoration efforts. Information from the studies will be communicated to the public consistent with the San Francisco Bay Mercury TMDL risk communication and reduction programs.

Mitigation Measure TERRBIO-B: 2:1 Replacement of tidal marsh (See Section 3.4.3) also applies here.

~~Alternative 6: No Project~~

~~Alternative 6 would not include any vegetation removal from the slough. Therefore a reduction in methylmercury production associated with vegetation root zones would not occur. Alternative 6 would not result in any perturbation from the current configuration. This is considered **No Impact**.~~

Impact WQ-4: **Potential to mobilize, transport, and deposit PCBs and organochlorine pesticides.**

Summary - Common to all Alternatives

Project activities (vegetation removal and dredging) would disturb the sediments making up the slough bottom and banks. The sediments are expected to settle quickly and use of a turbidity screen would limit their lateral transport. Concentrations of particle-associated 'legacy' pollutants, such as PCBs and organochlorine pesticides (i.e., DDT and chlordanes), which were deposited during the times of their historic peak use, are often substantially higher in subsurface sediments than surface sediments because their use was discontinued in recent years. Dredging would expose historically deposited sediments at the slough bottom. Because the dredged depth would not be maintained by the flow in the slough, sediments carried in by the tide would deposit at the slough bottom during the two slack water periods in each daily tidal cycle. Sediments from the Bay with ambient contaminant concentrations would cover the exposed historic deposits. Therefore, deeper sediments with higher contaminant concentrations would not be transported out of the Project area.

Alternatives 1 and 2

Alternatives 1 and 2 do not include dredging, Alternative 1 calls for vegetation removal over 2.6 acres and Alternative 2 calls for vegetation removal over seven acres. As discussed in the impact summary above, vegetation and root mass removal may result in immediate, short-duration exposure of sediments in the construction area. Use of the turbidity screen would limit the area of exposure and the sediments are expected to settle quickly. Surficial sediments disturbed by vegetation removal are expected to have PCB and organochlorine concentrations comparable to ambient sediments in the Project area. Root mass removal would disturb sediments down to four feet depth. The cores collected upstream of the Project area by the South Bayland's Mercury Project had higher concentrations of some PBTs in the bottom half (three to six feet) than the top half (zero to three feet). There is some potential to disturb higher contaminated sediments from the deeper root zone. The sediments would settle quickly and be contained within the Project area. The outcome would be that the rate of attaining target masses of organochlorine contaminants in sediments would be unaffected ~~(Curve A in Figure 3.2-3)~~. This impact is considered **Less than Significant.**

Alternatives 3, 4, and 5

Alternative 3 includes approximately 3.7 acres of vegetation and root mass removal and dredging to eight feet depth along the banks of the current slough channel. Alternative 4 includes 6.2 acres of vegetation removal and deep dredging to 16 feet depth and Alternative 5 includes 15.3 acres of vegetation removal and 9.7 acres of dredging to 10 feet depth.

As discussed above, the vegetation removal and dredging actions would temporarily resuspend sediments in the Project area. The sediments would settle quickly and would be contained within the Project area by a turbidity screen.

The results of the District's additional analyses on the South Baylands Mercury Study sediment cores showed that samples collected from the bottom half of the cores, three to six feet depth, were more contaminated with some legacy pollutants (e.g., PCBs and dieldrin) than the top zero to three feet, as discussed in the Physical Setting above (Section 3.2.2) and in more detail in Appendix B. Alternatives including dredging would remove the deeper, more contaminated sediments from the system. Removal of the contaminated sediments eliminates the risk of them being mobilized in future flood events or by bioturbation and mixing. As shown in Table 3.2-~~5~~6, above, dredging would remove 2-12 kg of PCBs, 1 – 3 kg DDT, and 0.1 – 1.0 kg of chlordane. The long-term outcome would be that the rate of attaining target masses of organochlorine contaminants in sediments would be accelerated, a beneficial effect. ~~(Existing Curve A is shifted towards Curve B in Figure 3.2-3). This impact is considered **Beneficial.**~~

A potential short-term outcome is that contaminated sediments are exposed by removing the in-place" cap of ambient sediments. This would occur if the depth of sediment contamination were greater than the depth of dredging. In that event, the long-term benefits of removing pollutant mass would be countered by short-term impacts from a temporary increase in the mass of contaminants in the actively resuspended layer. The perturbation would last until equilibrium is attained between Alviso Slough sediments and Lower South Bay sediments. The exact timeframe for this equilibrium to be attained is uncertain, but is estimated to be from one to ten years. This impact is considered **Less than significant with Mitigation.**

Mitigation Measure WQ-A: Drill cores and analyze sediment samples in the construction area to determine sediment disposal or reuse options and the resulting contaminant concentrations in surficial sediments exposed by dredging and vegetation removal.

Mitigation Measure WQ-B: Choose methods of dredging that minimize dispersion of suspended sediments. Hydraulic, as opposed to mechanical, dredging will reduce turbidity and dispersal of sediments mobilized by dredging activities. The dredging permit applications will also propose to include mitigation measures such as silt shrouds and use of flocculants (e.g., polyacilamide) to reduce sediment dispersal.

~~Alternative 6: No Project~~

~~Alternative 6, by itself would not result in mobilization and transport of near surface or deeper sediments. It would also not result in the benefit of removal of contaminated sediments which would occur with Alternatives 3, 4, and 5 which include dredging.~~

~~Alternative 6 would result in no increased exposure or transport of contaminated sediments. This is considered **No Impact.**~~

Impact WQ-5: **Potential impacts to water quality as a result of increased illegal discharges and dumping.**

Summary - Common to all Alternatives

An increase in public access to the Project area as a result of project implementation would likely result in decreased illegal discharges and illicit dumping. With more human activity in the area, these incidents are noticed sooner and more frequently, and there is a higher chance of being witnessed. This impact is considered **Beneficial** under all action Alternatives.

Alternatives 1, 2, 3, 4, and 5

Alternatives 1, 2, 3, 4, and 5 would result in decreased illegal discharges and dumping as a result of increased public access in the Project area. This impact is considered **Beneficial.**

Alternative 6: No Project

Alternative 6 would not result in increased public access to the Project area and a reduction in illegal discharges and dumping would not occur. This is considered **No Impact**.

Impact WQ-6 **Potential for surface water contamination of groundwater.**

Summary - Common to all Alternatives

If dredging proceeds to depths greater than the thickness of bay mud in the slough channel, a new pathway may be opened for downward migration of surface water to contaminate the underlying groundwater aquifer.

Alternatives 1 and 2

Alternatives 1 and 2 do not include any dredging. Alternatives 1 and 2 would not result in surface water contamination of groundwater. This is considered **No Impact.**

Alternatives 3, 4, and 5

Alternatives 3, 4, and 5 include dredging of the slough adjacent marsh to depths of 8, 16, and 10 feet respectively. The current depth of the channel thalweg is greater than the proposed dredging depths;

therefore a new pathway between the surface water and groundwater would not be created by the dredging activities

Alternatives 3 through 5 would not result in surface water contamination of groundwater if dredging proceeded to the current thalweg depth of the slough channel. This is considered **No Impact**.

Alternative 6: No Project

Alternative 6 would not involve any dredging. Alternative 6 would therefore not result in surface water contamination of groundwater. This is considered **No Impact.**

Impact WQ-7 Impacts from removal of navigational hazards.

Summary - Common to all Alternatives

Adverse water quality impacts may result from the continued presence of abandoned boats and derelict marine structures (i.e., old piers and pilings at SBYC). Exercising a reasonable standard of care in the removal of derelict marine structures would prevent careless release of wood and other flotsam that are unaesthetic and pose a hazard to recreational boating. Abandoned boats in the Project area are potential sources of water quality contaminants including petroleum hydrocarbons and copper from bottom paint. In removing the abandoned vessels, qualified marine salvage operators should be competent to develop and implement spill containment plans to prevent water quality impacts. These plans would specify measures including assessment of onboard fuel and oil supplies, the presence of leaks and exposed engine parts, deployment of booms and skimmers, and other accepted practices ot prevent discharge of gas and oil from boats as they are removed.

Alternatives 1, 2, 3, 4, and 5

Alternatives 1 through 5 include removal of the navigational hazards. Removal of the abandoned vessels would eliminate their potential to contaminate the water with petroleum hydrocarbons, copper, and other contaminants. Removal of the derelict marine structures improves boating safety and recreation in the area. This impact is considered **Beneficial.**

Alternative 6: No Project

Alternative 6 would not result in the removal of navigational hazards. Alternative 6 would therefore not result in removal of the abandoned vessels and their associated contaminants and these substances would continue to pose hazards to the environment. Because no change in the existing condition would occur, this is considered **No Impact.**

Impact WQ-8 Impacts from drying and rehandling removed sediment and/or vegetation.

Summary - Common to all Alternatives

As with any construction project involving earth moving, adverse water quality impacts may result from movement of sediment and vegetation to drying and rehandling areas. The primary impact of concern is tracking out sediments onto public roadways, resulting in discharges of sediment into municipal storm drain systems. The standard practice is to apply for coverage under the general permit for stormwater discharges due to construction activities and develop and implement a stormwater pollution prevention plan (SWPPP). A SWPPP specifies measures such as gravel entries to re-handling areas, washing stations for vehicles that include appropriate containment of wash water, and other measures needed to prevent trackout of mud, sediment, and vegetation debris onto public roadways.

Alternatives 1, 2, 3, 4, and 5

Alternatives 1 through 5 may result in trackout of sediment, mud, and vegetation debris. As with any earthmoving construction activity, coverage under the general permit for construction-related stormwater discharges will be obtained and a SWPPP will be developed and implemented. This impact is considered **Less than Significant**.

Alternative 6: No Project

Alternative 6 would not result in any risk of impacts from sediment or vegetation drying and re-handling. This is considered **No Impact**.

3.2.4 Relationship to South Bay Salt Ponds Phase 1 Action at Pond A8

This section describes the impacts of the project alternatives assuming the SBSP Phase 1 Action at Pond A8 is implemented. The Phase 1 Action will restore Pond A8 to muted tidal habitat by installing an adjustable notch in the levee separating Pond A8 from Alviso Slough. The notch will be open in the winter and closed in the summer so that spawning fish will not be trapped in the pond. When the notch is open the bed of Alviso Slough will be tidally scoured. The tidal scour is expected to deepen the slough a few inches or less. When the notch is closed and the tidal prism in the slough returns to current conditions, sediment will deposit on the slough bottom restoring that which was scoured out. This cycle of scour and deposition will occur each year with no net change in slough depth. See Section 3.1 Hydrology for further information.

Impact WQ-1: **Potential to cause localized low DO levels.**

Increased tidal prism would tend to be a benefit to local DO conditions because of movement and exchange of water within the far South Bay as a whole and Alviso Slough specifically, as related to the adjustable notch. This benefit could be offset if the restored tidal marsh area within Pond A8 and adjoining areas accumulates significant amounts of chemical oxygen demand because of algal blooms or other factors. Water quality within the SBSP Restoration Project area will be adaptively managed with monitoring and management actions as outlined in that project's Adaptive Management Plan. Because the notch at Pond A8 will be adjustable, if adverse water quality conditions, including low DO, occur in the pond, the notch can be adjusted or closed to ameliorate impacts in the pond and prevent impacts to Alviso Slough.

Alternatives 1, 2, 3, 4, and 5

Opening Pond A8 to tidal exchange could potentially result in introduction of higher chemical oxygen demand from the restored tidal marsh area of Pond A8. Because water quality in the pond, including COD, will be adaptively managed to avoid excessive COD and because the notch connecting the pond to Alviso Slough can be adjusted to prevent pond water with high COD from entering Alviso Slough, this impact is considered **Less than Significant**.

Alternative 6: No Project

Alternative 6 would not alter conditions in the Slough or influence Pond A8 operations that may affect COD; thus, the alternative would result in **No Impact.**

Impact WQ-2: **Potential to mobilize, transport, and deposit mercury-contaminated sediments.**

Alternatives 1, 2, 3, 4, and 5

Increased tidal prism in the Project area as a result of the Phase 1 Action at Pond A8 will be muted. Tidal scour is expected to extend a few inches in depth, mobilizing surficial sediments with ambient mercury concentrations. Tidal scour would reverse when the notch is closed in winter, as discussed above. The result is no net transport of sediments from the Project area. The Project would beneficially affect the Slough by removal of mercury containing sediments. Any residual mercury following cessation of Project related activities would be exposed to scour induced by the notch operations. As scour and recover would be expected, this impact is considered **Less than Significant** with implementation of the proposed mitigation discussed above.

Alternative 6: No Project

Alternative 6 would not alter conditions in the Slough or influence Pond A8 operations that may affect mercury sediment exposure; thus, the alternative would result in **No Impact.**

Impact WQ-3: **Potential to increase net methylmercury production and bioaccumulation in the food web.**

Alternatives 1, 2, 3, 4, and 5

Increased tidal prism and scour could result in minor perturbation of surficial sediments. The Phase 1 Action at Pond A8 is less than significant due to the SBSP Adaptive Management Plan and the adjustable nature of the notch planned for the Pond A8 Phase 1 Action. ~~The Alviso Slough Restoration Project is less than significant because any transient increases in reactive mercury are offset by a reduction in the methylation rate resulting from vegetation removal.~~ This impact is **Less than Significant** with implementation of the proposed mitigation discussed above.

Alternative 6: No Project

Alternative 6 would not alter conditions in the Slough or influence Pond A8 operations that may affect mercury methylation potential; thus, the alternative would result in **No Impact.**

Impact WQ-4: **Potential to mobilize, transport, and deposit PCBs and organochlorine pesticides.**

Alternatives 1, 2, 3, 4, and 5

Increased tidal prism in the Project area as a result of the Phase 1 Action at Pond A8 would be muted. Tidal scour is expected to extend a couple or few inches in depth, mobilizing surficial sediments with ambient contaminant concentrations. Tidal scour will reverse when the notch is closed in summer, as discussed above. The result is no net transport of sediments from the Project area. This impact is considered **Less than Significant** with implementation of the proposed mitigation discussed above.

Alternative 6: No Project

Alternative 6 would not alter conditions in the Slough or influence Pond A8 operations that may affect contaminant exposures of surficial sediments; thus, the alternative would result in **No Impact**.

Impact WQ-5: **Potential impacts to water quality as a result of increased illegal discharges and dumping.**

Alternatives 1, 2, 3, 4, and 5

The Phase 1 Action at Pond A8 will not affect public access in the area. Increased public access as a result of the Alviso Slough Restoration Project would reduce incidents of illegal discharges and dumping as discussed in Section 3.2.3 above. This impact is considered **Beneficial**.

Alternative 6: No Project

Alternative 6 would not change the existing likelihood of illegal discharges and dumping and thus result in **No Impact**.

Impact WQ-6: **Potential for surface water contamination of groundwater.**

Alternatives 1, 2, 3, 4, and 5

Muted tidal restoration of Pond A8 is expected to result in limited channel scour in Alviso slough downstream of the proposed A8 notch. Dredging alternatives would not deepen the slough beyond the current thalweg depth, shown on Figure 2-1. No new pathways would be created between the surface water and groundwater aquifer. This impact is considered **Less than Significant.**

Alternative 6: No Project

Alternative 6 would not alter groundwater conditions and thus result in **No Impact**.

Impact WQ-7 **Impacts from removal of navigational hazards.**

Alternatives 1, 2, 3, 4, and 5

Abandoned boats should be removed from public waterways regardless of the activity in Pond A8, which would not add to the number of boats to be removed. This impact is considered **Beneficial.**

Alternative 6: No Project

Alternative 6 would result in **No Impact**.

Impact WQ-8 **Impacts from drying and rehandling removed sediment and/or vegetation.**

Alternatives 1, 2, 3, 4, and 5

The activity in Pond A8 may require some construction staging area. This can be coordinated with the Alviso Slough Restoration Project through a common application for coverage under the general permit for stormwater discharge from construction activities, or separate applications. In either case, this impact is considered **Less than Significant.**

Alternative 6: No Project

Alternative 6 would result in **No Impact.**

3.2.5 Sediment Disposal Options

Sediment disposal options include trucking or barging the dredged sediment to a location where it could be re-used, rather than trucking the material to the Newby Island Landfill, as described in Chapter 2. These disposal options would not result in negative impacts to water and sediment quality as proper permitting and pollution prevention plans would be employed. Sediment reuse as wetland foundation material, if possible, may require employment of a slurry pipe to move the sediment. Impacts to water and sediment quality are not anticipated provided appropriate spill prevention measures are employed. Beneficial re-use of dredged sediments will follow guidelines established by the RWQCB in its draft Long Term Management Strategy for Beneficial Re-use of Dredged Sediments (LTMS). Relevant guidelines are shown in Table 3.2-7.

Table 3.2-7 Guidelines for the Beneficial Re-use of Sediments According to the LTMS.

Contaminant	Screening guideline for wetland foundation material ("non-cover") (µg/kg)	Screening guideline for wetland surface material ("cover") (µg/kg)
Mercury	700	430
PCBs	180	22
DDTs (sum of)	46	7.0
Chlordanes (sum of)	4.8	2.3
Dieldrin	4.3	0.71

3.3 BIOLOGICAL RESOURCES – AQUATIC (AQBIO)

3.3.1 Regulatory Setting

This section describes the regulatory and physical setting relevant to the fisheries and aquatic resources of Alviso Slough. The information presented in this section is based on a review of existing documentation, information collected in the field, LGRP requirements, discussions with resource agency staff regarding fisheries resources, and identification of potential impacts associated with proposed project elements. This discussion is informed, in part, by the work of an advisory panel consisting of three fisheries experts, who were employed by the District to provide an independent review of the fisheries reports prepared for this EIR. These experts – Chris Kitting at California State University East Bay, Jeff Kozlowski, Senior Fish Biologist at Jones & Stokes, Inc., and Tom Taylor, Senior Consultant at Entrix, conducted a site visit and reviewed the technical report that served as the basis of analysis in this section. This section describes the regulatory and physical setting relevant to the fisheries and aquatic resources of Alviso Slough. The information presented in this section is based on a review of existing documentation, information collected in the field, LGRP requirements, discussions with resource agency staff regarding fisheries resources, and identification of potential impacts associated with proposed project elements.

Several federal and state agencies have regulatory authority or responsibility over activities that affect fisheries and aquatic resources in the Project area. These regulatory authorities are described below and summarized in Table 3.3-1.

Table 3.3-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
FEDERAL	
USFWS and NMFS *Endangered Species Act (ESA)*	Pursuant to the federal Endangered Species Act (ESA), the USFWS and National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS) have authority over projects that may result in take of a federally listed species. Under the ESA, "take" is to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." The USFWS has also interpreted the definition of harm to include significant habitat modification. If the project may affect a federally listed species, either an incidental take permit, under Section 10(a) of the ESA, or a federal interagency consultation, under Section 7 of the ESA, is required. The USFWS has regulatory jurisdiction over freshwater and estuarine fishes, while NMFS has jurisdiction over anadromous and marine species. California Central Coast (CCC) steelhead trout (*Oncorhynchus mykiss*) distinct population segment (DPS) (formerly evolutionary significant unit [ESU]) is listed as threatened under federal ESA and is known to occur in the Project area. Green sturgeon, southern DPS (*Acipenser medirostris*) is also listed as threatened under federal ESA. There are no documented occurrences of green sturgeon in the Project area; however, it is likely that they would periodically utilize aquatic habitats in the South Bay and potentially Alviso Slough. Additional information on these two species, including summary species accounts is provided under Section 3.3.2 below.

Agency + Plan or Policy	Overview & Applicability
NMFS *Sustainable Fisheries Act (PL 94-265)*	In response to growing concern about the status of U.S. fisheries, Congress passed the Sustainable Fisheries Act of 1996 (Public Law [PL] 104-297) to amend the Magnuson-Stevens Fishery Conservation and Management Act (PL 94-265), the primary law governing marine fisheries management in the federal waters of the U.S.. Under the Sustainable Fisheries Act, consultation by NMFS is required on any activity that might adversely affect essential fish habitat (EFH). EFH includes those habitats that fish rely on throughout their life cycles. It encompasses habitats necessary to allow sufficient production of commercially valuable aquatic species to support a long-term sustainable fishery and contribute to a healthy ecosystem. Aquatic habitats in the Project area have been designated as EFH for multiple fish species under the NMFS jurisdiction. Alviso Slough is designated as EFH for fall-run chinook salmon (*Oncorhynchus tshawytscha*), northern anchovy (*Engraulis mordax*), and starry flounder (*Platichthys stellatus*).
USACE *Clean Water Act, Section 404*	See Section 3.2, Water and Sediment Quality, for a discussion of the CWA, Section 401. Many surface waters and wetlands in California, including Alviso Slough, meet the criteria for waters of the U.S. Alviso Slough is a navigable water of the U.S.. Under Section 404, the USACE must consider impacts on listed species under ESA; it thereby incorporates USFWS and NMFS findings on impacts regarding federally listed fish species in its permit conditions. Any federal or state agency can be consulted by the USACE when a CWA permit is reviewed and Individual Permits under Section 404 include a public review process. The U.S. EPA has jurisdictional authority over the CWA and can enter the permit review process at any time. The USEPA can also veto a USACE issued Section 404 permit.
RWQCB *Clean Water Act, Section 401*	See Section 3.2, Water and Sediment Quality, for a discussion of the CWA, Section 401
STATE	
CDFG *California Endangered Species Act (CESA)*	Pursuant to the California Endangered Species Act (CESA), a permit from California Department of Fish and Game (CDFG) is required for projects that could result in the take of a species that is state-listed as threatened or endangered. Under CESA, "take" is defined as an activity that would directly or indirectly kill an individual of a species; the CESA definition of take does not include "harming" or "harassing," as the ESA definition does. As a result, the threshold for take is higher under CESA than under ESA (i.e., habitat modification is not necessarily considered take under CESA). There are no known fish species present in the Project area that are listed as threatened or endangered under CESA.
CDFG *Fish and Game Code, Section 1602*	All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources are subject to regulation by CDFG under Section 1602 of the California Fish and Game Code. Under Section 1602, it is unlawful for any person, governmental agency, or public utility to do the following without first notifying CDFG: substantially divert or obstruct the natural flow of, or substantially

Agency + Plan or Policy	Overview & Applicability
	change or use any material from the bed, channel, or bank of any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. A stream is defined as a body of water that flows at least periodically or intermittently through a bed or channel that has banks and supports fish or other aquatic life. This definition includes watercourses with a surface or subsurface flow that supports or has supported riparian vegetation. CDFG's jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife. A CDFG streambed alteration agreement must be obtained for any project that would result in an impact on a river, stream, or lake.
SWRCB, RWQCB *Porter-Cologne Water Quality Control Act*	See Section 3.2, Water and Sediment Quality, for a discussion of the Porter-Cologne Water Quality Control Act.
BCDC *McAteer-Petris Act*	See Section 3.2, Water and Sediment Quality, for a discussion of the McAteer-Petris Act.
BCDC *Coastal Zone Management Act*	See Section 3.2, Water and Sediment Quality, for a discussion of the Coastal Zone Management Act. The BCDC also has jurisdiction over certain managed wetlands, salt ponds, and certain waterways. The BCDC has previously issued Permit No. 5-02 to the District for activities in tidal marsh adjacent to Alviso Slough, including periodic mowing of tidal marsh vegetation and debris removal to aid in conveying and directing flood flows from the Guadalupe River. The BCDC has indicated that portions of the work included in the Alviso Slough Restoration Project may be covered under Permit No. 5-02.
LOCAL	
Santa Clara County *Santa Clara County General Plan*	The Santa Clara County General Plan provides overall guidance for resource conservation in Santa Clara County and includes several resource conservation strategies that relate to fisheries and aquatic resources.
City of San Jose *San Jose-2020 General Plan*	The San Jose 2020 General Plan provides the general policy on the future character and development. It intends to preserve and restore natural characteristics of South Bay and adjacent lands, and states that the city should cooperate with federal environmental resource management agencies.

3.3.2 Physical Setting

This section discusses aquatic habitats, the aquatic food web, and fisheries resources present in the regional setting and Project area. Special attention is focused on sensitive fisheries resources including the CCC steelhead trout DPS and several other native fish species. This information is based on a synthesis of existing information and new information generated during field assessments in fall 2006.

Aquatic Habitats

Aquatic habitats in the Project area include those contained within Alviso Slough between Gold Street Bridge and the County Marina. Other regional water bodies that are connected to Alviso Slough and thereby influence the fisheries and aquatic resources of the slough include the Guadalupe River, Coyote Creek, South Bay, and the salt ponds.

Regional

The Guadalupe River flows north out of the Santa Cruz Mountains, through the City of San Jose, and into South Bay at the town of Alviso. The river is formed by the joining of Guadalupe Creek and Alamitos Creek at Almaden Lake, which is impounded by the Alamitos drop structure. The major tributaries to the Upper Guadalupe River (above Almaden Lake) include Arroyo Calero, Alamitos Creek, and Guadalupe Creek, which flow out of the dammed Calero, Almaden, and Guadalupe Reservoirs, respectively. Tributaries to the Lower Guadalupe River include the un-dammed Ross and Canoas Creeks, and Los Gatos Creek, which flows out of Lexington Reservoir. These streams drain a steep upper watershed and receive runoff from urban residential and commercial areas before entering the Guadalupe River. The Guadalupe River is fed by tributaries that begin as coldwater mountain streams and passes through the foothills, becomes low-gradient, and warms by the time it nears Alviso. The fish and invertebrate community of the Guadalupe River is indicative of a stream type species assemblage. It is composed of freshwater resident species that inhabit the river for the entirety of their life history and anadromous species (i.e., species that migrate from marine habitats as adults to spawn in freshwater) that utilize the river as spawning and rearing habitat. The construction of levees and dams, past agricultural land use, conversion of estuarine wetlands to salt ponds, and urban development in the watershed have greatly affected populations of anadromous species.

San Francisco Bay is the largest estuary on the west coast of North America and is an extremely productive and diverse ecosystem encompassing nearly 1,600 square miles of northern California (NOAA 2006). Salt water from the Pacific Ocean meets the main freshwater inputs of the Sacramento and San Joaquin Rivers, and other rivers to create brackish conditions of varying salinities throughout the Bay. South Bay is generally characterized by large areas of shallow expanse surrounding a deeper channel (10–15 meters [m]) that runs down the center of the Bay (MSI 2002). It supports some of the most important habitat remaining in the entire Bay Area for a number of fish and wildlife species, in spite of the highly urbanized surrounding areas and dramatic alteration of the Bay itself for shipping, salt production, and urban development (Goals Project 1999). Salinities vary seasonally with freshwater inputs from upstream runoff. The variations in salinity can have a significant effect on phytoplankton production and contribute to the seasonal variability in the presence and abundance of various species of fishes in the South Bay (MSI 2002). Aquatic habitats in the South Bay include open water, tidal mudflats, tidal marsh, and salt marsh/salt ponds. The aquatic species found in the South Bay are resident, migratory, and anadromous, and may utilize different South Bay habitats at different life stages and times of year.

Before European settlement of the San Francisco Bay area, Native Americans harvested salt from natural salt ponds in the South Bay. These natural ponds were located in marshlands scattered along the shoreline. Commercial production of salt began in 1854 and by the 1930s, almost half of the South Bay's historical tidal marshes had been converted into salt ponds (California Research Bureau 2002). Recently, a number of commercial salt ponds have moved out of production and are in the process of being converted back to serve as wildlife habitat. Although many species are not adapted to the high salinity conditions, the salt ponds around Alviso provide habitat for a variety of invertebrates, fish, and wildlife species. The salt ponds are generally characterized by high salinity, warmer temperatures, and very low flow.

Alviso Slough is a freshwater to brackish water channel that serves as the intermediary between the Guadalupe River and the San Francisco Bay estuary. The community of Alviso is located on the east bank of the Slough and marshlands border the slough along its edges. Prior to the 1940s, Alviso Slough was a relatively broad channel of the Lower Guadalupe River with fresh and brackish water marsh on either side. It was subject to tidal action and had abundant water flow in and out to the Bay, which continually scoured the channel and kept it relatively free of sediment build-up. Now, levees constructed for salt pond production and to provide flood protection, partially seal off the Slough from tidal action, in turn, decreasing water flow through the channel, and allowing sediment to build up. Additionally, land surface subsidence, salt water intrusion, construction of dams upstream (that interrupt sediment transport), and conversion of wetlands to salt ponds are other well-documented reasons why the physical environment of the slough has changed in the last 50 years. The combined anthropogenic alterations within the slough channel and its upstream watershed have resulted in a current slough channel where dense growth of emergent aquatic vegetation has increased the change in hydraulic capacity of the slough as well as the associated changes in tidal prism, salinity gradients, and the quality, and availability of aquatic habitat (e.g., conversion of open water to marsh, reduced depths, changes in salinity) for a variety of fish and macroinvertebrates (Hanson, unpublished draft 2004). The primary aquatic habitats in the Alviso Slough vicinity are described below.

Wetlands

Lands in transition between terrestrial and aquatic systems, where the water table is usually at or near the surface or the land is covered by shallow water, are considered wetlands. Brackish and freshwater marshes are common wetland types in Alviso Slough and are described below.

Brackish Marsh

Brackish marsh habitat occurs in the low-to-mid intertidal reaches of sloughs and creeks draining into the Bay, where vegetation is subject to tidal inundation diluted by freshwater flows from upstream. Interstitial soil salinities generally range from 3–15 parts per thousand (ppt) (USGS 2007), depending on their location in the estuary. Tidal marshes may be highly productive, with export of organic matter to tidal sloughs, channels, mudflats, and the Bay. Brackish marshes are particularly important for anadromous fish and invertebrates, such as salmon and shrimp, which use brackish marshes during their migrations between saline and freshwater habitats to physiologically acclimate to changing salinity.

Freshwater Marsh

Freshwater marsh habitat typically occurs in the upper reaches of sloughs and creeks draining into the Bay. While these reaches may be subject to tidal influence, they are flushed with freshwater on a daily basis, and therefore support mostly freshwater emergent vegetation. Water-surface elevation within reaches of freshwater marsh may vary by as much as 10 feet depending on daily tidal activity and seasonal, freshwater flows from upstream. Broad-leaf cattail (*Typha latifolia*) and the taller bulrushes, including California bulrush (*Scirpus californicus*) and hard-stem bulrush (*Scirpus acutus*), typically dominant these habitats areas. Freshwater marshes provide important nursery grounds for juvenile freshwater and anadromous fishes.

Open Water

Open water habitats include a variety of habitat types including subtidal Bay waters, tidal sloughs and channels, (such as Alviso Slough), and areas of standing or flowing waters within the salt ponds and tidal marshes. Open water habitat is characterized by the lack of terrestrial or emergent vegetation, and provides important habitat for large numbers of benthic (bottom-dwelling) and pelagic (open water) invertebrates and fish. Tidal sloughs and channels that carry water between salt ponds, marsh remnants, and through marshes provide important habitat for large numbers of benthic and pelagic invertebrates, and fish. These detritus-rich channels serve as important nurseries and feeding areas for freshwater, estuarine, and anadromous fish.

Mudflats

Intertidal mudflats are expanses of minimally to unvegetated mud that are inundated by mean high tide waters and exposed during mean low tide. Most mudflat habitat occurs just beyond the edge of fully vegetated wetlands at the mouths of sloughs, but also occurs between the low-flow channel and edge of wetlands within the tidal reaches of slough and creek channels draining into the Bay. Mudflats are dynamic depositional features, changing in extent and location depending on the nature of erosion and the deposition of sediments. Mudflat substrate is composed primarily of fine-grained silts and clays that support an extensive community of diatoms, worms, and shellfish, as well as algal flora (Life Science 2003; Warwick and Price 1975). Crustaceans, oligochaete and polychaete worms, gastropod and bivalve mollusks, and other invertebrates live on or just below the surface of the mud. During high tides, fish move over the mudflats to feed on these invertebrates and then move back to the main channel with receding tides.

Salt Pond Complex

Salt ponds in the South Bay are generally characterized by expanses of non-tidal open water, bare mud, or bare salt flats surrounded by mostly barren levees. Vegetation is sparse and limited on most levees. Salinities vary among South Bay salt ponds from less than 40 ppt where many invertebrate and fish species thrive, to greater than 200 ppt where even brine shrimp (*Artemia* spp.) cannot survive. The plankton, invertebrate, and vertebrate communities in salt ponds become less complex with increasing salinity, being dominated by fewer species as salinity increases. For example, a high abundance of macroscopic green algae, microscopic algae, and diatoms are found in lower salinity salt ponds and are replaced by unicellular algae such as *Stichococcus bacilaris* in higher salinity ponds. The availability of primary producers as food sources dictates the abundance of organisms higher up the food chain. Piscivorous (fish-eating) fish species find food only in the low-salinity ponds (Carpelan 1957; Lonzarich 1989), while species that forage on brine flies, water boatmen, and brine shrimp in the higher salinity ponds can benefit from the considerable biomass of these invertebrates. Currently there are no connections between the salt ponds surrounding Alviso Slough and the slough itself.

Project Area

The Project area includes the stretch of Alviso Slough from slightly downstream of the entrance to the County Marina to just upstream of the Gold Street Bridge. There is little aquatic habitat diversity within the Project area. The section of Alviso Slough in the Project area contains an open water channel bordered by freshwater and brackish marsh. At low tide there may be some exposed mudflats along the marsh open-water channel edge, but at higher tides only open water and marsh habitat is present. Marsh vegetation is composed mainly of tules and cattails that are encroaching upon the open water channel. Photographs of aquatic habitats present in Alviso Slough are provided in Figures 3.3-1 and 3.3-2.

Aquatic Invertebrate Communities and Food Web

Regional

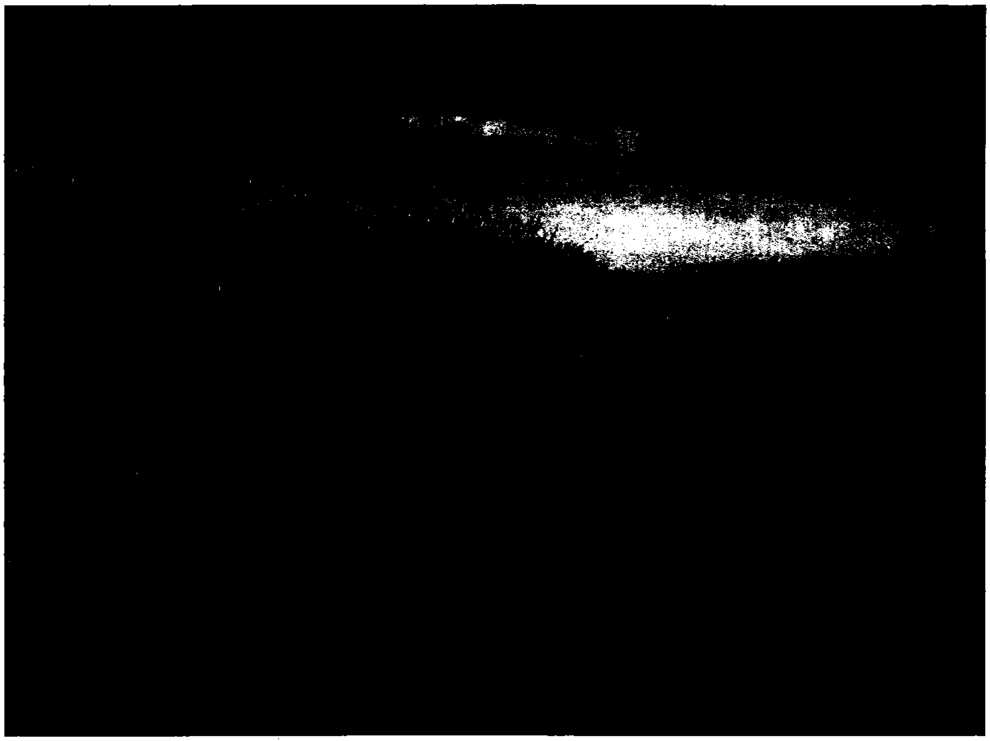
The South Bay is a complex estuarine ecosystem, an area of transition between inland sources of freshwater and saltwater from the ocean. While this transition happens gradually over a large area in the Bay-Delta and north San Francisco Bay, the transition zone is greatly condensed in Alviso Slough. The transition from fresh to salt water occurs very quickly over a small geographic area, resulting in an array of aquatic habitats for a variety of aquatic invertebrate species in the greater Alviso Slough complex. The main habitat types can be grouped into open water habitats, wetland marshes, salt ponds, and mudflats. The physical characteristics of these different habitats drive the foundation of the aquatic food web in Alviso Slough. The main influences include salinity, temperature, flow velocity, substrate composition, and sun exposure. All of these factors vary seasonally and tidally.

A primary energy input to the system is solar radiation, which is used along with nutrients, by the primary producers (e.g., phytoplankton, vascular plants, and macroalgae) to convert inorganic carbon and nutrients to organic matter through photosynthesis. Zooplankton (e.g., copepods, cladocerans, mysid shrimp), prey on the phytoplankton (i.e., microscopic photosynthetic plants). The vascular plants and macroalgae are grazed on and also produce detritus, which is decomposed by microbes and consumed by detritivores (e.g., oligochaete and polychaete worms, amphipods, cladocerans, and a diverse group of other fish and macroinvertebrates). Organic matter in the form of detritus is an especially important component of the food web in the Alviso Slough complex due to turbid waters and the associated limited sunlight penetration to support phytoplankton production. The primary consumers are in turn preyed upon by secondary consumers, consisting mainly of a variety of invertebrates (e.g., oligochaete and polychaete worms, snails, copepods, mysid shrimp, bay shrimp [*Cragon* spp.], and crabs) and fish (topsmelt [*Atherinops affinis*], threadfin [*Dorosoma petenense*] and American shad [*Alosa sapidissima*], gobies, sculpin, juvenile steelhead and chinook salmon, and a variety of other resident and migratory fish species). These in turn are preyed on by top consumers, such as fish (striped bass [*Morone saxatilis*], leopard sharks [*Triakis semifasciata*], and sturgeon [*Acipenser* spp.]), marine mammals, birds, and humans. The role of a species in the food web differs depending on life stage, or a species may utilize various levels of the food web simultaneously.

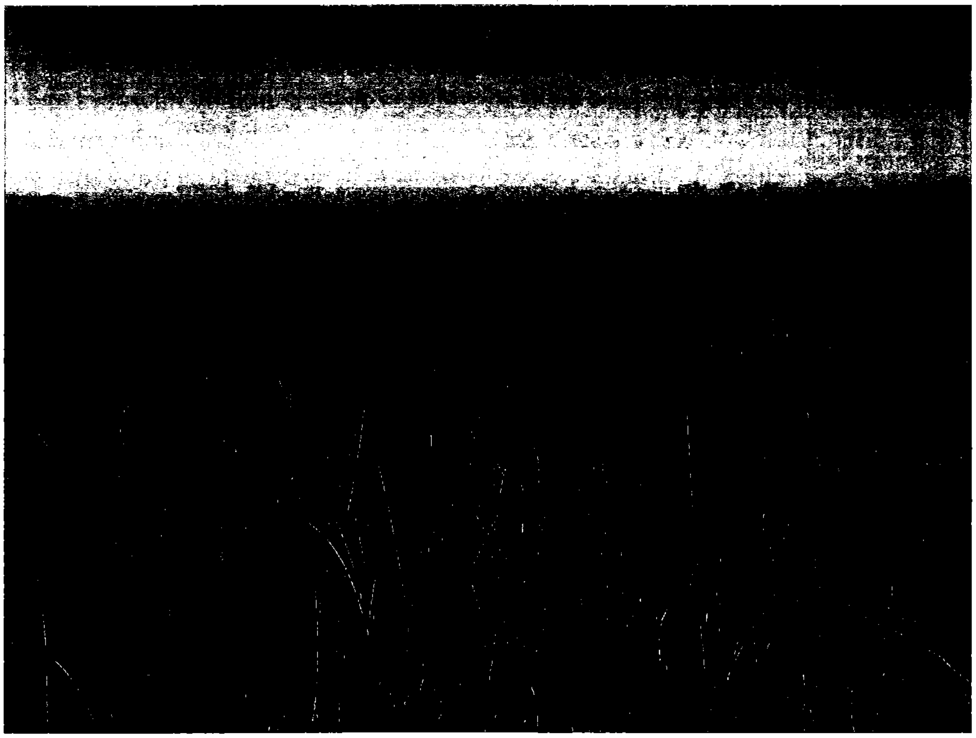
The following sections briefly discuss the major components of the Alviso Slough and South Bay aquatic community, including phytoplankton, zooplankton, benthic and other macroinvertebrates, and fish.

Phytoplankton

Phytoplankton are small photosynthetic plants that form the base of the estuarine food web. They are usually microscopic in size and consist of single cells or chains of cells. Major groups of phytoplankton in the estuary include diatoms, dinoflagellates, and cryptomonads (Herbold et al. 1992). Phytoplankton are

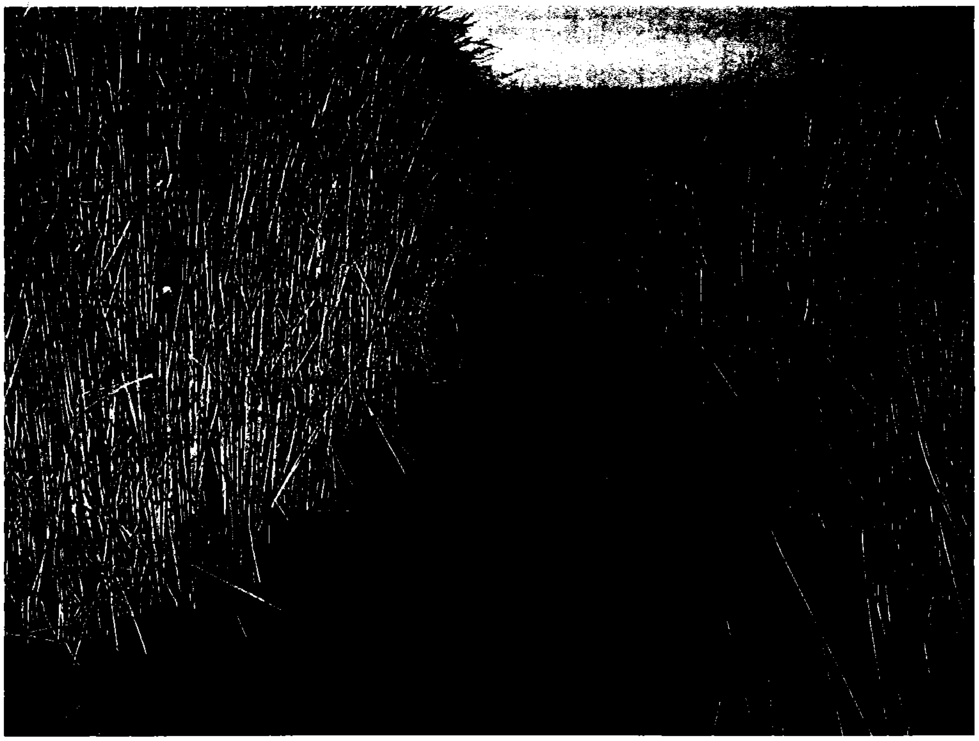


(a) Open water and vegetated (marsh) edge

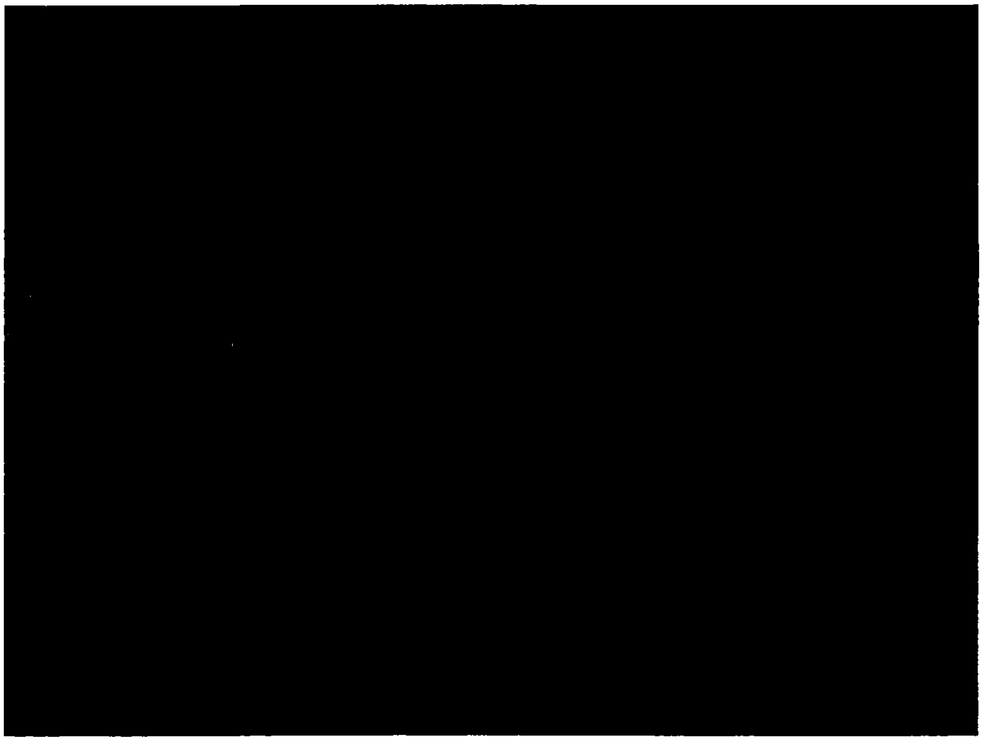


(b) Alviso Slough channel and associated marsh (looking downstream toward South Bay)

Figure 3.3-1 Photographs of Aquatic Habitats in Alviso Slough (1 of 2)



(c) Remnant channel from Alviso Slough to Inactive County Marina



(d) Partially exposed mudflat near mouth of Alviso Slough (downstream of Project area)

Figure 3.3-2 Photographs of Aquatic Habitats in Alviso Slough (2 of 2)

important to the ecology of the estuary because of their position at the base of the food web. The seasonal abundance (standing crop) of copepods, cladocerans, and other pelagic herbivores closely follows the seasonal cycle of phytoplankton abundance in the estuary. Juvenile survival and growth of many fish species such as striped bass and threadfin shad, within the South Bay and elsewhere within the estuary, largely depends on the quality and quantity of phytoplankton and/or associated zooplankton available as a direct or indirect food resource.

Phytoplankton production is directly related to several important physical and chemical conditions, including warm temperatures, high solar radiation, high nutrients, slow-moving water, low turbidity and suspended sediment concentrations, shallow waters, and position of the salt water-freshwater mixing zone. The phytoplankton bloom in the southern embayment occurs in the spring during a period of clear water that allows enough light penetration through the water column for the phytoplankton to grow (USGS 2006).

Zooplankton

Zooplankton are microscopic and macroscopic animals that are planktonic (free-floating) or weak swimming fish and invertebrates. Some are permanent members of the plankton and are known as holoplankton. Others, such as eggs, larvae, and juveniles of benthic invertebrates and fish, are members of the plankton only during early lifestages and are known as meroplankton. A number of zooplankton species have been introduced into the estuary through ballast water discharges from commercial shipping and have impacted native species inhabiting the estuary (Kimmerer 1998).

Zooplankton, the primary consumers within the estuary, are at the center of the estuarine food web and therefore are not only important to lower trophic levels upon which they feed (e.g., phytoplankton, detritus), but also to the higher trophic levels for which they serve as prey (e.g., fish and macroinvertebrates). Zooplankton include herbivores, which forage mainly on phytoplankton, and detritivores that feed on detritus and microbes. Zooplankton are primarily suspension feeders that include small macroinvertebrates such as copepods and cladocerans, and also fish and macroinvertebrate eggs and larvae, including topsmelt larvae, threadfin shad, and striped bass eggs and larvae, crabs, and bay shrimp. The abundance and distribution of zooplankton varies substantially within the estuary in response to seasonal cycles and environmental factors such as salinity gradients, river flow, and tidal currents.

Salinity is one of the major factors affecting the distribution and abundance of zooplankton within the estuary, as evidenced by the changes in species composition that occur within various regions of the estuary. The distribution and abundance of zooplankton are also related to the availability of food. Physical and chemical conditions that promote phytoplankton productivity (warm temperatures, high solar radiation, high nutrients, slow-moving water, low turbidity and suspended sediment concentrations, shallow waters, etc.) indirectly promote the productivity of zooplankton. Water body configuration and bathymetry also affect phytoplankton productivity and, therefore, zooplankton productivity. Shallow, slow-moving open and backwater areas of the estuary are generally highly productive. The location of the saltwater and freshwater mixing zone during the spring also influences the abundance of both phytoplankton and zooplankton in the estuary. When the mixing zone is located in shallow portions of sloughs and marsh, the abundance of both phytoplankton and zooplankton increases.

Seasonal variations in zooplankton abundance are determined by temperature or photoperiod, coastal hydrography, seasonal cycles of phytoplankton, and estuary inflow and outflow (Kimmerer 2002a, 2002b). Zooplankton biomass tends to be highest in the estuary during spring and early summer.

Benthic and Epibenthic Macroinvertebrates

The benthic and epibenthic communities of the marine inshore waters of the South Bay include a diverse group of marine macroinvertebrates. Within the estuary, benthic macroinvertebrates typically live within the top 12 inches of sediment on the Bay floor. Epibenthic macroinvertebrates typically live on the sediment surface. These include gastropods (snails), oligochaetes and polychaetes (sea worms), bivalves (mussels and clams), and crustaceans (barnacles, isopods, amphipods, crabs, and shrimp).

The characteristics of the benthic and epibenthic macroinvertebrate community are influenced by a variety of physical and water quality conditions that occur within the estuary, the most important being flow velocities, substrate characteristics, and salinity gradients (Thompson et al. 2000). The factors most affecting the abundance, composition, and health of the benthic community from year to year are outflow from the Guadalupe River, local runoff, and pollution (Nichols and Pamatmat 1988). Lower outflows are associated with lower phytoplankton biomass and hence lower productivity during periods of low flow. High outflows lead to lower salinities, which particularly control the species abundance and composition in shallow areas where animals are exposed to less saline surface water.

Benthic communities in the estuary have also been influenced by disturbances such as dredging and filling activities. Sediment grain-size distributions show that sandy sediments persist in areas of high current velocities such as the channel areas (Rubin and McCulloch 1979), while finer sediments settle in areas of lower current velocity such as in the shoals and small channels (Krone 1979). Benthic and epibenthic invertebrate populations are generally most abundant in areas having reduced water velocities, fine-grained sediments, and relatively stable benthic environments (little sediment resuspension, movement or disturbance, slow rates of accretion or depletion of sediments). In deeper water channels, and high velocity areas characterized by sand and coarse substrate with substantial daily, seasonal, or interannual substrate movement and accretions and depletions, benthic and epibenthic macroinvertebrate communities characteristically have reduced species diversity and abundance.

Many of the more common benthic species that inhabit the estuary are not native to the region but have been transported and introduced into the estuary through the discharge of ballast water from commercial ships, or on the shells of oysters brought from the East Coast for commercial farming in the late 19th century (Carlton 1979). Today, over 40 percent of the individuals that make up the benthic community in a given area of the estuary can be nonindigenous species (Carlton 1979; Cohen 2000). Many of these introduced species serve ecological functions similar to those of the native species they may have displaced; however, some species may be detrimental to the aquatic ecosystem of the estuary. All but two of the benthic mollusks (i.e., oysters, clams) are introduced. Unlike the mollusks, the epibenthic crustacean community (e.g., crabs and shrimp) inhabiting the Bay is still made up of mainly native species, particularly bay shrimp. The smaller epibenthic fauna in the estuary are dominated by four species of shrimp commonly called bay shrimp: California bay shrimp (*Crangon franciscoru*), blacktail bay shrimp (*C. nigricauda*), blackspotted bay shrimp (*C. nigromaculata*), and oriental shrimp (*Palaemon macrodactylus*). California bay shrimp are most abundant in lower salinities, blacktail bay shrimp prefer salinities of 25 ppt or more, and blackspotted bay shrimp are seldom found at salinities below 30 ppt (Baxter et al. 1999). All three *Crangon* shrimps show responses to flow patterns, where the mechanism appears to be greater transport of post-larval shrimp into the estuary by bottom currents in years of high freshwater outflow. Crabs inhabiting the South Bay are dominated by the native dungeness crab (*Cancer magister*) and the introduced Chinese mitten crab (*Eriocheir sinensis*) (CDFG unpublished data).

Processes that regulate the abundance and distribution of benthic communities also affect the colonization of the bottom after disturbances, such as modification or removal of habitat by dredging, sediment disposal, levee breaching, or creation of new subtidal and intertidal aquatic habitat. Patterns of reproduction and the availability of colonists can also have a profound effect on benthic community recovery. Polychaete and oligochaete worms, bivalve mollusks, crabs, and shrimp recruit by small larval stages that can be planktonic and capable of dispersal over large geographic areas, or by larger crawl-away larvae that remain near the adult habitat on the bottom. Amphipods and other similar crustaceans brood their young until they are small juveniles that disperse much like crawl-away larvae. In some species, the adults are the dispersal stage and the first colonists after disturbance. Benthic macroinvertebrates typically have high fecundity and dispersal mechanisms that facilitate the colonization of habitat within the estuarine environment.

Predation by Fish Communities

Fish species may utilize the Bay estuary for any or all of their life history stages. They may have planktonic, epibenthic (demersal), and pelagic (open water) life histories. The majority of fish species inhabiting the estuary (e.g., topsmelt, threadfin shad, striped bass, gobies, etc.) have planktonic larval stages; as plankton, they feed on zooplankton and in some cases phytoplankton. Many of these species forage on plankton during the larval and early juvenile lifestages, and then as juveniles and adults become more selective predators that feed on large invertebrates and fish. Demersal fish such as sturgeon, gobies, sculpin, and striped bass are planktivorous as larvae but begin to feed on epibenthic invertebrates and fish as juveniles. Many smaller adult pelagic fish including topsmelt and threadfin shad are planktivorous throughout their lives. Some estuarine fish do not rely on plankton as a major food source at any lifestage. Certain species feed exclusively upon detritus, submerged vegetation, and aquatic insects.

Project Area

Alviso Slough contains a variety of aquatic habitats that have the potential to support great diversity in macroinvertebrates. Different habitats support varying species assemblages within the Alviso Slough area. Intertidal mudflats are very productive habitats and often support an abundance of crustaceans, worms, and mollusks. Detritus gets deposited from tidal marshes, and phytoplankton, algae, and diatoms settle in the water column, providing abundant food sources for these invertebrates. Tidal marshes may be highly productive, exporting organic matter (i.e., detritus) to tidal sloughs, channels, mudflats, and the Bay. Invertebrates use vegetation as a food source and a habitat substrate, and shrimp and other crustaceans may forage within the submerged vegetation. Open water habitats support large plankton populations. Tidal sloughs and channels that carry water between salt ponds and marsh remnants and through marshes provide important habitat for large numbers of benthic and pelagic invertebrates.

On a site visit to Alviso Slough on December 7, 2006, two benthic samples were collected from different sites within the Project area. The two sites were at the upstream and downstream ends of the Project area (i.e., the County Marina and Gold Street Bridge). Samples were collected from benthic sediments, and aquatic vegetation and were sent to the CDFG Aquatic Bioassessment Laboratory (ABL) for identification and analysis. Due to gear limitations and associated difficulties in obtaining adequate samples that are representative of the entire benthic community, the results of the sampling will be used as reference but may not be indicative of the complete invertebrate community.

Benthic Sample Results

The first of two samples was taken upstream of the Gold Street Bridge in the benthos (bottom sediments) near of the edge of the marsh vegetation in the open water main channel. Benthic samples were taken from the sediment with a D-frame net and the net was then trawled through the water column. Samples were deposited into plastic containers and filled with ethanol (specimen preservative). Laboratory results showed a total of 37 individuals in the sample with the dominant taxa being oligachaete worms (*Annelida*) (see Figure 3.3-3). Other taxa in the sample included fly larvae (*Diptera*), sowbugs (*Isopoda*), and an amphipod crustacean. The oligachaetes were likely contained within the benthic sediment, from which they filter out organic debris. The dipterans, mainly midge (*Chironomidae*) and cranefly (*Tipulidae*) larvae, may have been on the surface of the sediment, drifting in the water column, or attached to vegetation remnants that were also present in the sample.

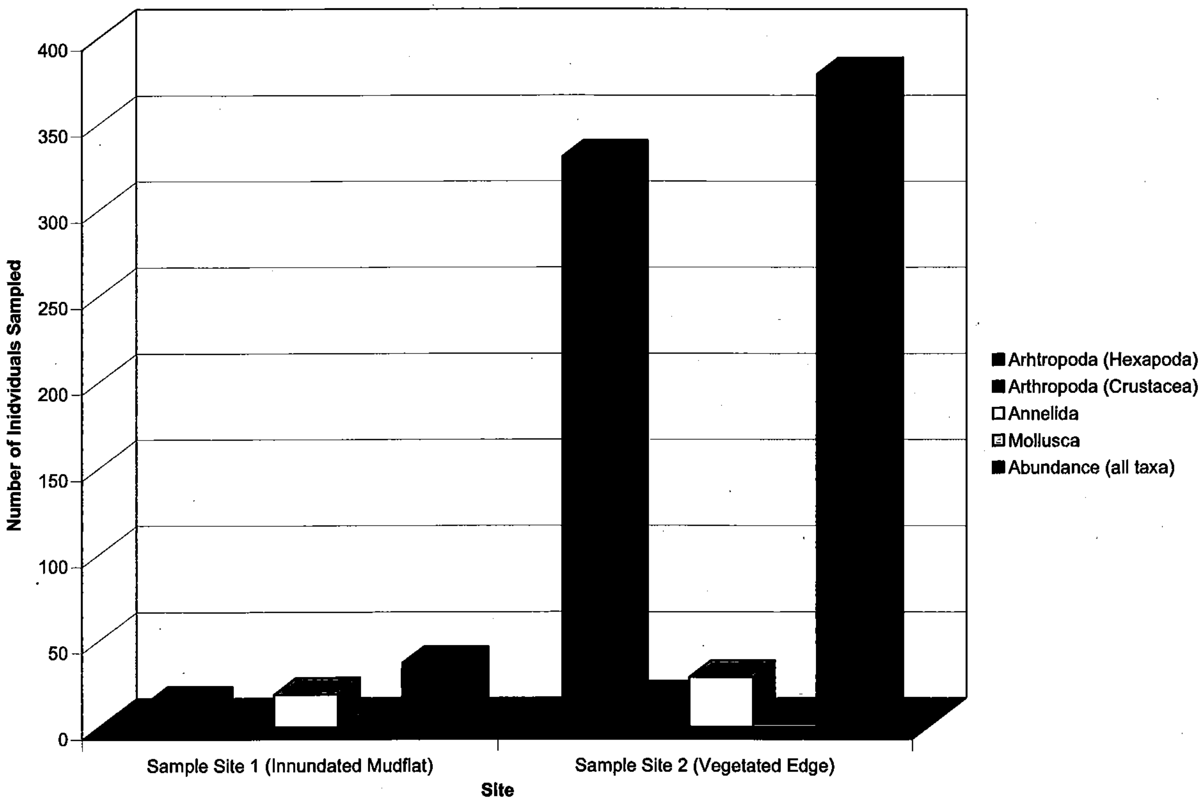


Figure 3.3-3 Macroinvertebrates Sampled by Site / Habitat Type

The second sample was taken just upstream of the town of Alviso in the small remnant channel that connected Alviso Slough to the once-active County Marina. This channel has partially filled in with emergent aquatic vegetation. The channel is adjacent to Alviso Slough but is perpendicular to the main flow of the slough. This sample location provides a good representation of vegetated edge-type habitat conditions. From the bank, the D-frame net was used to collect a sample from the benthic substrate and associated marsh vegetation. The sample was placed into plastic containers, filled with ethanol, and sent to the CDFG ABL for analysis. The sample included a total of 379 organisms and was dominated by crane flies (*Diptera, Tipulidae*), with midge (*Diptera, Chironomidae*) as the second most abundant taxa in the sample (see Figure 3.3-3). Other taxa included oligachaete worms, crustaceans (*Hyalellidae, Hyalella*), and other true flies (*Diptera*). Oligochaetes may have inhabited the benthic substrate, while flies are most-likely associated with the vegetated edge. There were many adult (winged) flies/midges present on the water surface during the time of collection, and it is possible that some of these individuals were incorporated into the sample.

The total number of individual taxa collected per sample was eight and nine for sites one and two, respectively. This measure of taxa richness reflects the diversity of the aquatic assemblage, where increasing diversity correlates with increasing health of the assemblage; decreasing richness correlates with increasing disturbance. No intolerant (i.e., sensitive) taxa were collected at either of the two sites. Additionally, no mosquitoes were collected in either of the samples.

Fisheries Resources

The fisheries community composition for the region and Project area has been characterized below based on existing data sets, reporting from locations in the vicinity of the Project area, and through field habitat assessments. Fish – habitat relationships were also identified and used to predict species/community presence in the Project area based on habitat associations.

Regional

The greater Alviso area includes the Lower Guadalupe River, Alviso Slough, the surrounding salt ponds, and the South Bay. The species assemblage of these habitats is quite diverse and includes species adapted to a variety of environmental conditions. These species include freshwater resident species of the Lower Guadalupe River, anadromous species that are spawned in freshwater, rear and live as adults in the estuary and ocean, and return to fresh water to reproduce; estuarine species that inhabit different areas of the estuary throughout their lives, and saltwater species that utilize the estuary as spawning and rearing or foraging habitat. The presence or absence of a species in a given area depends on many variables including time of year, temperature, salinity, habitat type, and species life-stage.

The Lower Guadalupe River is a low-gradient, freshwater urban stream controlled by seasonal precipitation patterns and dam and groundwater releases in the upper watershed. The river provides habitat for both resident and anadromous freshwater species. Downstream reaches may provide foraging habitat for fish species feeding on detritus, algae, and other vegetation, plankton and zooplankton, macroinvertebrates, and small fish. While some resident species may be present year-round, the fisheries community is dynamic and changes seasonally, with temperature and flow variation as important variables.

Alviso Slough provides freshwater and brackish tidal habitat for freshwater, estuarine, and saltwater species. The open water channel provides a migration corridor for anadromous species, feeding habitat for planktivorous and piscivorous fishes, and spawning habitat for broadcast spawners. The open water channel may be used as a migration corridor for adult anadromous species returning to the Guadalupe River to spawn or juveniles migrating downstream to the ocean. The marsh along the banks provides rearing and foraging habitat for a variety of estuarine and marine fishes that utilize the submerged vegetation as a food source, structure for food sources, protection from predators, or as a spawning substrate. The mudflats occurring between the open water channel and marshes at high tide provide foraging habitat for fish species that feed upon benthic crustaceans, invertebrates, and worms, and spawning habitat for mudflat spawners such as yellowfin goby (*Acanthogobius flavimanus*) or longjaw mudsuckers (*Gillichthys mirabilis*). The species present depend on the physical habitat type as well as and salinity and temperature, which are determined in large part by tide levels and outflow from the Guadalupe River. The habitat use and functions of intertidal and subtidal areas vary in response to these physical factors as well as to differences in life-history characteristics and habitat requirements for the Bay's wide variety of species (Hanson, unpublished draft 2004).

The South Bay salt ponds are generally shallow, open water expanses lacking vegetation. There is very little structure or cover for use as habitat, but aquatic vegetation growth occurs in certain ponds providing a food base for invertebrate and fish species. The fish species found in the salt ponds (e.g., longjaw mudsucker) are either planktivores feeding on macroscopic or microscopic algae, diatoms, rotifers, or piscivores that feed upon smaller fishes or upon crustaceans and benthic macroinvertebrates. Elevated salinity levels make many salt ponds uninhabitable for some or all aquatic species.

South Bay habitats are very diverse and include open waters, freshwater marsh, brackish marsh, saltwater marsh, mudflats, and saltponds. A wide variety of fish species may be present in the South Bay depending on the time of year: saltwater and estuarine species such as sharks, flounders, and rays may move into the region tidally to feed on fish and invertebrates; anadromous species (steelhead and chinook salmon) return to feed, spawn, and rear in tributaries; and resident and partial resident species (yellow fin goby, rainwater killish [*Lucania parva*], longjaw mudsucker) move between different South Bay habitats throughout the year. A list of fish species with the potential to inhabit Alviso Slough is presented in Table 3.3-2.

Project Area

Native fish species known to occur in the Project area include: chinook salmon, steelhead trout, topsmelt, Sacramento sucker (*Catostomus occidentalis*), northern anchovy, longfin smelt (*Spirinchus thaleichthys*), Pacific lamprey (*Lampetra tridentata*) and pacific staghorn sculpin (*Leptocottus armatus*). Introduced species include striped bass, American shad, threadfin shad, common carp (*Cyprinus carpio*), rainwater killifish, and yellowfin goby.

Special-Status Fish Species

Special-status fish species are legally protected or are otherwise considered sensitive by federal, state, or local resource conservation agencies and organizations. Special-status fish species addressed in this section include:

- Species listed as threatened or endangered under the state or federal Endangered Species Acts;
- Species identified by USFWS, NMFS, or CDFG as species of special concern; and
- Species fully protected in California under the California Fish and Game Code.

Table 3.3-2 Fishes Potentially Inhabiting Alviso Slough

Common Name	Scientific Name	Native (N) or Introduced (I)	Status		Fishery Status[1]
			NMFS	CDFG	
Chinook salmon	*Oncorhynchus tshawytscha*	N	EFH	CSC	Commercial, Recreational
Central California Coast steelhead	*Oncorhynchus mykiss*	N	T	--	Recreational
Longjaw mudsucker	*Gillichthys mirabilis*	N	--	--	Recreational as bait
Longfin smelt	*Spirinchus thaleichthys*	N	--	C	--
Northern anchovy	*Engraulis mordax*	N	EFH	--	Commercial
Sacramento sucker	*Catostomus occidentalis*	N	--	--	--
Pacific staghorn sculpin	*Leptocottus armatus*	N	--	--	Commercial
Leopard shark	*Triakis semifasciata*	N	--	--	Commercial
Bat ray	*Myliobatis californica*	N	--	--	Commercial
Whitebait smelt	*Allosmerus elongates*	N	--	--	--
Sacramento splittail	*Pogonichthys macrolepidotus*	N	--	--	--
Bay pipefish	*Syngnathus leptorhynchus*	N	--	--	--
Shiner perch	*Cymatogaster aggregate*	N	--	--	Commercial
Walleye surfperch	*Hyperprosopon anale*	N	--	--	Commercial
Arrow goby	*Clevelandia ios*	N	--	--	--
Cheekspot goby	*Ilypnus gilberti*	N	--	--	--
Bay goby	*Lepidogobius lepidus*	N	--	--	--
Speckled sanddab	*Citharichthys stigmaeus*	N	--	--	--
Starry flounder	*Platichthys stellatus*	N	EFH	--	Commercial
Sand sole	*Psettichthys melanostictus*	N	--	--	Commercial
Plainfin midshipman	*Porichthys notatus*	N	--	--	Commercial
Pacific herring	*Clupea harengus*	N	--	--	Commercial
Jacksmelt	*Atherinopsis californiensis*	N	--	--	Commercial
Threespine stickleback	*Gasterosteus aculeatus*	N	--	--	--
Sierra mackerel	*Scomberomorus sierra*	N	--	--	Commercial
White sturgeon	*Acipenser transmontanus*	N	--	--	Recreational
Green sturgeon	*Acipenser medirostris*	N	T	--	Recreational
Pacific lamprey	*Lampetra tridentata*	N	--	--	--
Yellowfin goby	*Acanthogobius flavimanus*	I	--	--	Commercial, Recreational as bait

Table 3.3-2 Fishes Potentially Inhabiting Alviso Slough (Continued)

Common Name	Scientific Name	Native (N) or Introduced (I)	Status		Fishery Status[1]
			NMFS	CDFG	
Rainwater killifish	*Lucania parva*	I	--	--	--
Common carp	*Cyprinus carpio*	I	--	--	Commercial, Recreational
Striped bass	*Morone saxatilus*	I	--	--	Recreational
Black bullhead	*Ictalurus melas*	I	--	--	--
Brown bullhead	*Ictalurus neulosus*	I	--	--	--
American shad	*Alosa sapidissima*	I	--	--	Recreational
Threadfin shad	*Dorosoma petenense*	I	--	--	Commercial, Recreational as bait
Shimofuri goby	*Tridentiger bifasciatus*	I	--	--	--
Chameleon goby	*Tridentiger trigonocephalus*	I	--	--	--

Source: CDFG 2005, Moyle 2002; USGS unpublished data; Hanson unpublished draft 2004; Laine unpublished 2006

[1] Commercial fisheries information based on information from CDFG commercial fish landings (2005).

EFH = Essential fish habitat designated by NMFS
T = Threatened
C = California candidate species
CSC = California species of special concern (no formal protection)

~~Three~~ Four special-status fish species (California Central Coast Steelhead, Green Sturgeon Southern DPS, ~~and~~ longfin smelt and fall-run Chinook salmon) have the potential to occur in Alviso Slough. Genetic analysis of fall-run chinook salmon (~~generally~~ designated as a CDFG special-status species) in the Guadalupe River has shown that these fish are not naturally spawned populations, but derived from hatchery stock and it is currently not known if these fish have naturalized; therefore, the federal special-status designation does not apply (SCVWD, pers. comm., 2007; Hedgecock et al. 2002). However, fall-run Chinook salmon are designated as species of concern by CDFG, regardless of their origin. The status of the four ~~three~~ special-status species is summarized in Table 3.3-3.

Fish Species of Management Concern – Status and Life Histories

Evaluating potential project-related effects on fish resources requires an understanding of the fish species' life histories and life stage-specific environmental requirements. This information is provided in Appendix C for the fish species of primary management concern that have potential to occur within Alviso Slough. Species of primary management concern include special-status species, native species, and those nonnative species that are recreationally and/or commercially important.

Because these species collectively represent a diversity of life histories and environmental requirements, and because they are among the most sensitive to environmental perturbation, the findings from assessments made for these species can be effectively used to make inferences to other fish species that may use Alviso Slough. Species of primary management concern with the greatest potential to be affected by the proposed Project are discussed below and summary life history accounts are provided in Appendix C.

Table 3.3-3 Special-Status Fish Species with Potential to Occur in Alviso Slough

Species	Status[1]		Habitat	Potential to Occur in Alviso Slough
	NMFS	CDFG		
Central California Coast steelhead *Oncorhyncus mykiss*	T	--	Requires cold, freshwater streams with suitable gravel for spawning; rears in seasonally inundated floodplains, rivers, tributaries, and the Bay. Adult life spent in the ocean.	Occurs in Alviso Slough
Green Sturgeon, Southern DPS *Acipenser medirostris*	T	--	Spends majority of life in nearshore oceanic waters, bay, and estuaries; spawns in freshwater rivers.	Spawns in Sacramento River; expected to occur only as a rare and irregular visitor to estuarine habitats in the South Bay / Alviso Slough
Longfin smelt *Spirinchus thaleichthys*	--	C	Spawns in tidally influenced freshwater wetlands and seasonally submerged uplands. Generally found in estuarine bays.	Occurs in Alviso Slough
Fall-run chinook salmon *Oncorhynchus tshawytscha*	--	CSC	Requires cold, freshwater streams with suitable gravel for spawning; rears in seasonally inundated floodplains, rivers, tributaries, and the Bay. Adult life spent in the ocean.	Occurs in Alviso Slough; however, genetic analysis of fall-run chinook salmon in the Guadalupe River has shown that these fish are not naturally spawned populations, but derived from hatchery stock and it is currently not known if these fish have naturalized; therefore, the special-status designation does not apply (SCVWD, pers. comm., 2007; Hedgecock et al. 2002)

[1] Legal Status Definitions
Federal Listing Categories (NMFS)
T Threatened (legally protected)
State Listing Categories (CDFG)
C Candidate (as of February 8, 2008)
CSC California species of special concern (no formal protection)

Source: Data compiled by EDAW in 2007 and revised in 2008

A summary habitat association and utilization matrix for fish species of management concern is provided in Table 3.3-4. The matrix identifies associations between fish species / life-stages and the primary habitat types found in the Project area. The associations were identified from life history habitat suitability requirement information for each species and attributes and functions of those habitat types found in the Project area (i.e., marsh, open water, and inundated mudflat).

3.3.3 Environmental Impacts and Mitigation

Overview

This assessment of potential Project impacts~~, both adverse and beneficial,~~ on fisheries and aquatic resources that could result from potential Project components/activities was evaluated based on design, construction, and operational elements of the potential Project alternatives. Evaluation criteria include

Table 3.3-4 Summary Habitat Association and Utilization Matrix for Alviso Slough Restoration Project – Fish Species of Management Concern

Species[1]	Aquatic Habitat Association and Utilization[1]			Management Status[2]
	Marsh	Open Water	Inundated Mudflat	
CCC steelhead *Oncorhynchus mykiss*	R	A	--	SS, N, R
Fall-run chinook salmon *Oncorhynchus tshawytscha*	R	A	--	EFH, SS, N, C, R
Green sturgeon *Acipenser medirostris*	--	A, R	A, R	SS, N (low probability of occurrence)
Longfin smelt *Spirinchus thaleichthys*	A, S, R	A, R	--	SS, N (low probability of occurrence)
Northern anchovy *Engraulis mordax*	A, R	S, R	S, R	EFH, N, C
Topsmelt *Atherinops affinis*	A, S, R	A, R	--	N, C, R
Sacramento sucker *Catostomus occidentalis*	A, R	A, R	A, R	N
Longjaw mudsucker *Gillichthys mirabilis*	A, S, R	--	A, S, R	N, R (bait)
Pacific staghorn sculpin *Leptocottus armatus*	--	R	A, S, R	N, C
Pacific lamprey *Lampetra tridentata*	R	A	--	N
Threespine stickleback *Gasterosteus aculeatus*	A, S, R	--	--	N
Striped bass *Morone saxatilus*	--	A, R	--	I, R
American shad *Alosa sapidissima*	--	A, R	--	I, R
Threadfin shad *Dorosoma petenense*	--	A, R	A, R	I, C, R (bait)
Yellowfin goby *Acanthogobius flavimanus*	--	A, R	A, S, R	I, C, R (bait)
Rainwater killifish *Lucania parva*	A, S, R	--	--	I (forage species)

[1] Life-Stage
A = Adult holding and migration
S = Spawning
R = Rearing (juvenile)

[2] Management Status Categories
SS = Special-status (NMFS / USFWS / CDFG)
EFH = Essential Fish Habitat designated by NMFS
N = Native
I = Introduced
C = Commercial
R = Recreational

Source: Compiled by EDAW 2007 (see summary species accounts for literature review) potential fish species presence, distribution, abundance, and relevant life-stage requirements, and aquatic habitat conditions in areas potentially affected by possible Project components/activities.

Vegetation Removal and Dredging Best Management Practices (Industry Standard BMPs not District BMPs)

Some vegetation removal and dredging impacts to water quality and biological resources would be minimized through the use of standard BMPs (as appropriate) that have been described in the District's BMP Handbook (SCVWD 2006) as part of the proposed Project. In addition to those BMPS identified in the handbook, other Industry BMPs~~S~~ that would be incorporated into project implementation activities include:

- Use of silt curtains, which prevent suspended sediment from migrating out of the immediate Project area;
- Dredging only on the incoming tide; and
- ~~Hydraulic or closed clamshell dredging to reduce the generation of suspended sediments; and~~
- Employment of an independent, certified, on-board dredging inspector to ensure compliance with permit conditions.

Furthermore, monitoring should be conducted during dredging to allow for the following:

- Measurement of contaminated sediment removal efficiency;
- Determination of dredged volumes;
- Measurement of sediment resuspension at the dredge site; and
- Checking performance of barriers and other controls.

Additional BMPs and/or measures that should be implemented to avoid and/or minimize potential impacts include:

- Implement other Industry Feasible Dredging BMPs for Work in Tidal Areas. Identify and implement feasible vegetation removal and dredging BMPs in consultation with USACE, USFWS, and CDFG. Dredging BMPs shall be consistent with strategies outlined in the Long-Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region (http://www.spn.usace.army.mil/ltms2001/) and may include the implementation of silt curtains and gunderbooms, and dredge operational controls.
- Implement District BMP W751M01, Feasible Spill Prevention and Hazardous Materials Management. The accidental release of chemicals, fuels, lubricants, and non-storm drainage water into channels shall be prevented to the extent feasible. Spill prevention kits shall always be in close proximity when using hazardous materials (e.g., crew trucks and other logical locations). Feasible measures shall be implemented to ensure that hazardous materials are properly handled and the quality of aquatic resources is protected by all reasonable means when removing vegetation and sediments from the slough. No fueling shall be done in the slough channel or immediate floodplain, unless equipment stationed in these locations is not readily relocated (i.e., Aquamog, pumps, generators). For stationary equipment that must be fueled on site, containments shall be provided in such a manner that any accidental spill of fuel shall not be able to enter the water or contaminate sediments that may come in contact with water. Any equipment that is readily moved out of the channel shall not be fueled in the channel or immediate floodplain. All

fueling done at the construction site shall provide containment to the degree that any spill shall be unable to enter the channel or damage wetland vegetation. No equipment servicing shall be done in the Slough channel or immediate floodplain, unless equipment stationed in these locations cannot be readily relocated (i.e., Aquamog, pumps, generators).

- Evaluate and Monitor Turbidity and Deliver Monthly Reports during Construction to the RWQCB and other applicable resource agencies. During vegetation removal and dredging activities, the District should monitor turbidity levels in the Project area. Basin Plan standards for turbidity state that Project activities will not cause an increase in ambient turbidity by more than 10 nepthalometric turbidity units (NTUs) above background turbidity where natural turbidity is greater than 50 NTU (San Francisco Bay Regional Water Quality Control Board 2006). During the first week of construction, turbidity measurements should be taken in Alviso Slough, upcurrent of construction and at distances of 200 and 600 feet downstream of the Project area for baseline comparison conditions. Measurements should be taken three times per day during the construction period, and measurements should be taken where the flow regime may be affected by the construction zone to ensure the sample is representative of the water quality affected by construction.

  If turbidity violates the Basin Plan standard described above, turbidity measurements should be repeated to confirm the exceedance. Should confirmational samples still violate the standard, additional measures should be taken to reduce the resuspension of sediment, including slowing the rate of vegetation removal or dredging, changing the configuration of silt curtain or other device, working during low tide, or other measures. Should these contingency actions not achieve compliance with the standard, operations should stop and the RWQCB should be notified. Investigation of the cause of the significant turbidity increase should be conducted and additional corrections in construction operations should be made where applicable. If necessary, the frequency and duration of monitoring may be revised in coordination with the RWQCB. This measure may be modified based on additional conditions imposed as part of the required permits from the USACE, RWQCB, USFWS, NMFS, and/or CDFG.

- Implement In-water Construction Work Windows. The District should identify and implement feasible in-water construction work windows in consultation with NMFS, USFWS, and CDFG. In-water work windows should be timed to occur when sensitive fish species are not present or least susceptible to disturbance (e.g., June through September). Likely work windows to avoid disturbance impacts are presented in Table 3.3-5. Additional specific details for work windows would be identified and implemented in consultation with NMFS, USFWS, and CDFG. NMFS will define construction windows for the project in their Biological Opinion.

Table 3.3-5 Likely Work Windows for Sensitive Wildlife Species (TERRBIO) and for Sensitive Fish Species (AQBIO)†

Wildlife	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
TERRBIO-1 Construction-related loss of, or disturbance to, special-status species, marsh-associated wildlife (Also relevant for TERRBIO-2, TERRBIO-4 and TERRBIO-13)												
Migratory Bird Breeding Season	■	■	▨	▨	▨	▨	▨	▨	▨■	■	■	■
Raptor/Owl & Clapper Rail Breeding Season	■▨	▨	▨	▨	▨	▨	▨	▨	■	■	■	■
AQBIO-4 Construction-related habitat disturbance (Also relevant for AQBIO-5 and AQBIO-7)												
Steelhead and Chinook Salmon	▨	▨	▨	▨	▨	■	■	■	■	■	■	▨
Longfin Smelt††	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨

† This table illustrates likely in-water work windows for sensitive fish species based on permit conditions for the SBSP Pond A8 project (provided for steelhead). Actual in-water work windows for the proposed project are subject to change and shall be developed in consultation with NMFS, USFWS, and CDFG.

†† Spawning generally occurs between November and June; however, fish could be present all year.

▨ Consultation required

■ General Work Window

- Handle Vegetation and Sediments So As to Minimize Potential Water Quality Impacts. The District or its contractors should store and transport sediments in a manner that minimizes potential water quality impacts. This includes locating storage areas away from drainages and waterways, outside the floodplain, and away from sensitive resources, as well as the use of containment facilities.
- Minimize Potential Impacts Associated with Access and Staging. The District or its contractors should use existing access ramps and roads where possible. If temporary access points are necessary, they should be constructed in a manner that minimizes potential impacts on wetlands and the slough channel. Equipment staging and vegetation/sediment drying areas should be located outside of the floodplain away from sensitive resources.
- Remove Temporary Fills as Appropriate. The District or its contractors should completely remove temporary fill, such as for access ramps, diversion structures, and/or cofferdams upon the completion of construction.

Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, a significant impact on aquatic resources would occur if the Project would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG, USFWS, or NMFS;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources;
- Conflict with the provisions of an adopted Habitat Conservation Plan (HCP); Natural Community Conservation Plan (NCCP); or other approved local, regional, or state habitat conservation plan; or
- Substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; or substantially reduce the number or restrict the range of an endangered, rare or threatened species.

Impacts & Mitigation

The impacts analysis in this ~~Draft~~ Final EIR evaluates five action alternatives and the required No Project alternative. The action alternatives include vegetation removal and/or dredging, as described in Chapter 2. Under the No Project alternative, the District would not take any action in the Project area and existing programs would continue. The analysis covers impacts from the construction and maintenance phases–both in the slough and at staging areas.

All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by BCDC, CSLC, the District, or SBYC by the time of commencement of construction of this Project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Table 3.3-6~~5~~ lists each impact identified for the proposed alternatives, along with the significance of each impact. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (less than significant and does not require mitigation), or Class IV (beneficial). Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections.

A discussion of regulations relevant to the Project is presented in Section 3.3.1 of this section. The Project would not result in a conflict with local policies or ordinances protecting biological resources. In addition, the Project would not conflict with a HCP/NCCP or other approved conservation plan as none exists for the area.

This section provides an analysis of all potential impacts (adverse and beneficial) on fisheries and aquatic resources due to implementation of the proposed Project alternative components/activities.

***Impact AQBIO-1:* Construction-related increases in sediments and turbidity.**

Summary - Common to all Alternatives

Construction activities would disturb marsh vegetation, marsh soils adjacent to open water channels, and in-water sediments. These activities would include initial vegetation removal, dredging, accessing equipment staging/access, and implementation of Mitigation Measures HYD-A and H YD-E identified in Section 3.1 (e.g., lowering Pond A8 weir and flood protection improvements). Any resulting disturbance of vegetation and in-water sediments and soils would temporarily increase turbidity and sedimentation upstream and downstream (dependent on tides) of the construction site throughout the Project area.

Table 3.3-6~~5~~ Impact and Mitigation Summary

Impact	Impact Significance	Mitigation Measures*
Impact AQBIO-1: Construction-related increases in sediments and turbidity.	Alts 1-5: Class III	--
	Alt. 6: No Impact	--
Impact AQBIO-2: Release and exposure of construction-related contaminants.	Alts 1-5: Class III	--
	Alt. 6: No Impact	--
Impact AQBIO-3: Construction-related release and exposure of legacy contaminants in sediments.	Alts 1-5: Class I~~II~~	WQ-A WQ-B WQ-C TERRBIO-B
	Alt. 6: No Impact	--
Impact AQBIO-4: Construction-related habitat disturbance.	Alt. 1: Class II	AQBIO-A AQBIO-B
	Alts 2-5: Class I	AQBIO-A AQBIO-B
	Alt. 6: No Impact	--
Impact AQBIO-5: Conversion of wetland / marsh aquatic habitat to open water habitat.	Alts 1-5: Class II	AQBIO-A TERRBIO-B
	Alt. 6: No Impact	--
Impact AQBIO-6: Impacts related to Mitigation Measure TERRBIO-B, wetland creation.	Alts 1-5: Class III	--
	Alt. 6: No Impact	--
Impact AQBIO-7: Increased entrainment of fish species into Pond A8.	Alts 1-5: Class II	HYD-A
	Alt. 6: No Impact	--
Impact AQBIO-8: Impacts related to increased boat use.	Alts 1-5: Class III	--
	Alt. 6: No Impact	--

Maintenance activities (i.e., follow-up vegetation removal and/or dredging) would be expected to be required every three to five years to retain the desired condition. These activities would result in similar disturbances to the aquatic environment.

Fish population levels and survival have been linked to levels of turbidity and silt deposition. Prolonged exposure to high levels of suspended sediment (as measured against ambient conditions) could create a loss of visual capability in fish within the Project area aquatic habitats, potentially leading to a reduction in feeding and growth rates; a thickening of the gills, potentially causing the loss of respiratory function; clogging and abrasion of gills; and increases in stress levels, reducing the tolerance of fish to disease and toxicants (Waters 1995). Turbidity also could result in increased water temperature and increased biological oxygen demand, both of which could affect DO levels and result in stressed respiration.

Disturbance of slough sediments and increases in turbidity can also result in chemical exchanges including the release of ammonia, which could result in both direct and indirect effects on the aquatic community. Unionized ammonia in the water column that becomes released from sediments could be directly toxic (chronic and acute) to fish and other aquatic organisms. Ammonia could also result in indirect effects including changes in pH, increases in biological oxygen demand, and decreases in DO. However, oxidative removal of ammonia from the water column generally occurs quite rapidly in well-oxygenated waters (U.S. Army Corps of Engineers 2004).

In addition, high levels of suspended sediments, increased turbidity, and associated chemical exchanges could cause the movement and redistribution of fish populations, and could diminish the character and quality of the physical habitat important to fish survival. Habitat disturbance and increased turbidity could also detrimentally affect fish forage species (e.g., macroinvertebrates and plankton) and degrade food web dependent micro-habitats within and adjacent to construction areas by interfering with the photosynthesis of aquatic flora and displacing aquatic fauna. Steelhead and other fish are sight feeders, and turbid waters reduce the ability of these fish to locate and feed on prey. Some fish, particularly juveniles, would likely become disoriented and could leave areas where food resources are located, potentially reducing growth rates. Avoidance of adverse habitat conditions by fish is the most common result of increases in turbidity and contaminants. Fish will not occupy areas that are unsuitable for survival unless they have no other option.

Alternatives 1, 2, 3, 4, and 5

Potential construction-related impacts to water quality (turbidity) and associated aquatic habitat would be minimized with implementation of BMPs and other measures implemented as part of the Project permitting requirements.

With implementation of BMPs and other measures outlined above, turbidity levels would be managed at levels that would not result in substantial effects on aquatic habitat or the fish community or else vegetation removal and dredging activities shall be halted. Because the area and volume of exposed sediment would vary by Project alternative (see Table 3.3-7~~6~~), the corresponding magnitude of the impact could also vary. However, because BMP and other measure performance standards would be the same for all Project alternatives, the impact conclusion would apply to all Project alternatives. This impact is considered **Less Than Significant**.

Alternative 6: No Project

Alternative 6 would not result in any disturbance to the sediments or resulting turbidity; there would be **No Impact** and no mitigation would be required.

Table 3.3-7~~6~~ Area of Exposed Sediment for Each Project Alternative

Project Alternative	Area of Exposed Sediment
Alternative 1	2.6 acres
Alternative 2	7.0 acres
Alternative 3	3.7 acres
Alternative 4	6.2 acres
Alternative 5	25.0 acres

Impact AQBIO-2: **Release and exposure of construction-related contaminants.**

Summary - Common to all Alternatives

The potential exists for contaminants such as fuels, oils, hydraulic fluids, and other chemicals/compounds used in construction activities to be introduced accidentally through spills into the waterway directly, or incrementally through surface runoff from haul routes and staging areas, or as a result of a discharge from barge or other water based equipment. Contaminants in sufficient concentrations would be toxic to fish and prey organisms occupying Project area habitats, or could alter oxygen diffusion rates, and cause acute and chronic toxicity to aquatic organisms, thereby reducing growth and survival and/or leading to mortality. Potential construction-related impacts associated with release of contaminants could be avoided and/or minimized with implementation of BMPs.

Alternatives 1, 2, 3, 4, and 5

Potential release and exposure of construction-related contaminants could be avoided and/or minimized with implementation of BMPs. This would be the same for all Project alternatives. This impact would be **Less Than Significant** and no mitigation would be required.

Alternative 6: No Project

No construction would take place under Alternative 6; therefore, the potential for release and exposure of construction-related contaminants would not exist. There would be **No Impact**.

Impact AQBIO-3: **Construction-related release and exposure of legacy contaminants in sediments.**

Summary - Common to all Alternatives

Bottom sediments exposed during dredging and/or vegetation removal could result in contamination of fish habitat, if the sediments contained any contaminants, or elevated levels of substances that could be, or become toxic to fish, or other aquatic life. Release and exposure of legacy contaminants in sediments could adversely affect aquatic habitats, the aquatic food web, and fish populations, including CCC steelhead, within the Project boundaries and in adjacent tidally influenced areas up and downstream of Project construction activities. These impacts could occur during the initial vegetation removal and/or dredging activities and during any potential follow-up (i.e., maintenance) activities. There is the potential for the sediments to contain contaminants (e.g., Hg, PCBs, legacy organochlorine pesticides, selenium, trace metals) that in sufficient concentrations could be harmful to sensitive fish, life stages, and other aquatic organisms.

A particular concern in regards to the aquatic ecosystem in Alviso Slough is mercury and methylmercury formation processes. Methylation of mercury is the key step in the entrance of mercury into the food web. Nearly 100 percent of the mercury that bioaccumulates in fish tissue is methylated. The rates of methylation are influenced by the bioavailability of inorganic mercury to methylating bacteria, the concentration and form of inorganic mercury, and the distribution and activity of methylating (i.e., sulfate-reducing) bacteria (Jones and Slotten 1996; Heim et al. 2003).

Hg research from the Bay-Delta consistently indicates that sediment methylmercury concentrations, methylmercury formation and demethylation, organism uptake and bioaccumulation, and mass flux of methylmercury transfer from sediment to water are highly dynamic processes that can vary considerably, depending on the habitat (e.g., wetlands/marsh, open water), location in the region, and a host of other factors (e.g., hydrologic factors, salinity, pH, temperature, organic matter, temporal-seasonal conditions) (Jones and Slotten 1996, Foe 2002, Gill et al. 2002, Stephenson et al. 2002, Choe and Gill 2003, Choe et al. 2003, Davis et al. 2003, Foe et al. 2003, Heim et al. 2003, Slotten et al. 2003, Wiener et al. 2003).

Alternatives 1, 2, 3, 4, and 5

As discussed in Section 3.2 under impacts WQ-2 and WQ-4, sediments disturbed during vegetation removal ~~and dredging activities~~ are expected to settle quickly, and use of a turbidity screen would limit their lateral transport. Concentrations of particle-associated 'legacy' pollutants, which were deposited during the times of their historic peak use, are often substantially higher in subsurface sediments than surface sediments because their use was discontinued in recent years, and dredging would expose historically deposited sediments at the slough bottom. Preliminary results of the South Baylands Mercury Project sediment cores showed, however, that sediments have relatively homogeneous total mercury concentrations to depths of six feet. Because the dredged depth would not be maintained by the flow in the slough, sediments carried in by the tide would deposit at the slough bottom during the two slack water periods in each daily tidal cycle. Sediments from the Bay with ambient contaminant concentrations would cover the exposed historic deposits. Therefore, deeper sediments with higher contaminant concentrations would not be transported out of the Project area. Furthermore, Alternatives 3, 4, and 5 include dredging that would result in the removal of any potentially contaminated sediments from the aquatic system, preventing mobilization to the Bay and advancing the recovery of the Bay from associated impairment. Alternatives 3, 4, and 5 would likely result in remobilization and exposure of sediments contaminated with mercury, PCBs, and organochlorine pesticides and if vertical profiles of sediment cores are comparable to cores assessed by the South Baylands Mercury Project, then the overall impact ~~Therefore, impacts~~ associated with release and mobilization of legacy sediments would be considered **~~Less than~~ Significant** after implementation of Mitigation Measures WQ-A and WQ-B. (See Section 3.2.3 for a detailed description of WQ-A and WQ-B).

As discussed in Section 3.2 under impact WQ-3, preliminary findings of the South Baylands Mercury Project indicate that mercury near the surface (i.e., upper 6 inches of sediment) is much more reactive than Hg at depth (i.e., below 6 – 12 inches). Therefore, even though total mercury concentrations at depth are comparable to those at the surface, activities that bring deeper sediments to the surface could increase the amount of reactive mercury in those deeper sediments, potentially causing a transient or longer-term "spike" in the production of methylmercury. It is not known for certain that this increase in reactive mercury would result in an increase in the methylation rate. Based on the findings of the South Baylands

Mercury Project ~~Study~~, it is ~~possible that dredging would increase available mercury. However, net mercury methylation is a product of mercury availability and mercury methylation rates. A concurrent finding discussed in coordination meetings with the South Baylands Mercury project is that removing vegetation root mass density decreases mercury methylation rates by reducing bacterial activity (Windham-Myers and Marvin-Dipasquale, 2007). Therefore, under all project alternatives, any disturbance that leads to a transient increase in mercury availability is predicted to be offset by a decrease in methylation rates in the Project area. The net decrease in methylation rates would ensure that mercury concentrations in the aquatic food web would not increase. As such, the project would have **Less than Significant** impacts on net mercury methylation.~~ highly probable that vegetation removal or dredging will increase available mercury. Based on that probability, it is likely, but less certain that the increase in available mercury, would lead to a transient increase in net methylmercury production. Should an increase in net methylation occur, it is possible, but again, not certain, that a significant increase in mercury bioaccumulation would occur. To be conservative, given the uncertainties, it is assumed that disturbance due to vegetation removal or dredging will cause a potentially significant increase in mercury bioaccumulation. This impact is considered **Significant** after implementation of Mitigation Measures WQ-C and TERRBIO-B (See Sections 3.2.3 and 3.4.3 for a detailed description of WQ-C and TERRBIO-B, respectively).

Alternative 6: No Project

Alternative 6 would not include any vegetation removal or dredging; therefore, the potential for release and exposure of legacy contaminants would not exist. There would be **No Impact**.

Impact AQBIO-4: Construction-related habitat disturbance.

Summary - Common to all Alternatives

Vegetation removal and dredging activities would result in habitat disturbance and direct effects on fish and other aquatic organisms. Individual fish present in the immediate work area could be injured or entrained by equipment used for vegetation removal and dredging. Due to their presence in the immediate area of disturbance, groundfish species would be more likely to be entrained or injured by dredging and vegetation removal equipment. Fish and other aquatic organisms displaced from their habitat due to vegetation removal or dredging could be harmed or killed, or could become vulnerable to predators, current velocity, or other unfavorable habitat conditions. Construction-related habitat disturbance could adversely affect the aquatic food web, and fish populations, including CCC steelhead, within the Project boundaries and in adjacent tidally influenced areas up and downstream of Project construction activities. These impacts would occur during the initial vegetation removal and/or dredging activities and during any potential follow-up (maintenance) activities. Avoidance of adverse habitat conditions by fish is the most common result of increases in disturbance. Fish will not occupy areas that are being actively disturbed unless they have no other option.

Fish present in the immediate work area could also be exposed and affected by sound pressure levels generated by the equipment (i.e., operation of Aquamog and pile driving [if necessary]). Available information indicates that exposure of fish species to underwater sound pressure levels exceeding approximately 180 decibels (dB) may result in sublethal (e.g., damage to ear, hearing impairments behavioral implications including delays in migration) or lethal (e.g., ruptured swim bladder, internal bleeding) effects (Laughlin 2005). These critical sound levels exceed levels that are anticipated to be associated with Project-related activities. A reference noise level for the proposed use of an Aquamog is not available at this time. The Aquamog is an aquatic-based piece of heavy construction equipment. It could operate an auger head, clam rake, claim bucket, roto-tiller, flail chopper, T-bar cutter, along with a hydraulic arm for extending attachment pieces, and paddle wheels that maintain the position of the Aquamog during operation. Based upon the components and use of the Aquamog, it closely resembles the noise characteristics of a crane. Therefore, a reference noise level of 85 dBA (decibels adjusted) at 50 feet (i.e., reference noise level associated with a crane) is a conservative proxy for this analysis. In order to remain conservative, the reference noise level assumed in this analysis for the aquatic harvester to be operated in conjunction with the Aquamog, would also be 85 dBA at 50 feet or 91 dBA at a distance of 10 feet (see also discussion in section 3.9, Noise). Pile driving activities with repetitive high peaks have been documented to generate up to about 115 dBA at a distance of 10 feet. Therefore, both activities are expected to be well below critical sound pressure levels for fish (mortality or injury). Regardless, exposure of fish to underwater sound pressure may result in behavioral avoidance or migration delays. Because Alviso Slough serves as a migration corridor for juvenile (and potential rearing) and adult steelhead, activities would need to be conducted when populations of these special-status species in Alviso Slough are low or not present. Resident species that may be present during construction activities would be expected to avoid the area. Additionally, mitigation measure NOI-C (see Section 3.9, Noise) would reduce the duration of sound pressure levels associated with pile driving, decreasing the any effects of pile driving sound pressure on fish.

The prey (e.g., macroinvertebrates, plankton) of resident and migratory fish populations would be adversely affected by construction-related disturbance including the loss (i.e., vegetation removal and dredging) and decline in habitat (i.e., water quality conditions) such as increased turbidity (see Impact 1 above), the decrease in DO content, and the increase in the level of pollutants (Coull and Chandler 1992). Impacts associated with vegetation removal activities would be especially adverse due to the overall importance of vegetated edge habitat as a food source in the slough (relative to open water and inundated mudflat – see Figure 3.3-3). Recolonization of the benthic community may include the same organisms or opportunistic species that have environmental requirements that are flexible enough to allow them to reoccupy a disturbed site more rapidly (Reilly et al. 1992). Recolonization of a disturbed site can begin quickly, although reestablishment of a more stable benthic community may take several months or years after the dredging operation has occurred (Oliver et al. 1977). Oliver et al. (1977) found that communities inhabiting highly variable and easily disrupted environments, such as those found in shallow water (similar to Alviso Slough), recovered more quickly from dredging operations than communities in less variable environments such as in deep or offshore waters. Seasonal changes in the environment were considered most important in shallower water where the organisms are more likely to be affected by the changing seasons (Reilly et al. 1992). Oliver et al. (1977) noted two phases of succession after a disturbance. In the first phase, opportunistic species such as some polychaetes and oligochaetes would move into a disturbed area. The second phase involved recruitment of organisms associated with undisturbed areas around the disturbed site. Recovery at the disturbed site would ultimately depend on the type of environment and the speed and success of adult migration or larval recruitment from adjacent undisturbed areas (Hirsch et al. 1978).

In Alviso Slough, initial recolonization would be expected to occur relatively quickly due to the tidal action that would aid in transporting organisms into the area affected by the construction activities. However, due to the need for reoccurring vegetation removal and dredging (as frequent as every three years) and the possibility that substrates may never fully stabilize, complete recovery of the disturbed site may not ever fully take place. Thus, this otherwise temporary impact would be considered permanent.

Alternative 1

Potential construction-related direct impacts to special-status fish species could be avoided and/or minimized with identification and implementation of construction work-windows in consultation with NMFS, CDFG, and USFWS. Direct effects on other fish species (non-special-status species) would not be expected to cause a fish population to drop below self-sustaining levels or threaten to eliminate the fish community. However, potential construction-related impacts to aquatic habitats (i.e., disturbance) resulting in permanent loss or degradation of the macroinvertebrate community (potential permanent impact due to reoccurring activities) could, in turn, result in substantial adverse effects to the fish community (including special-status species). This impact associated with Alternative 1 is considered **Less Than Significant with Mitigation** after implementation of the measures below.

Alternatives 2, 3, 4, and 5

Potential construction-related direct impacts to fish species with Alternative 2 through 5 would be expected to be similar to Alternative 1. Potential construction-related impacts to aquatic habitats (i.e., disturbance) resulting in permanent loss or degradation of the macroinvertebrate community (potential permanent impact due to reoccurring activities) could, similar to Alternative 1, result in substantial adverse effects to the fish community (including special-status species). This impact conclusion would apply to Alternatives 2 through 5. Those alternatives with the largest footprint would have the greatest impact. Additionally, Alternatives 3, 4, and 5, which include dredging components (in addition to vegetation removal, which is common to all alternatives), would be considered to have an increased level of impact because the amount of disturbance would be increased. Because of the increased size and magnitude of disturbance associated with Alternatives 2 through 5, this would be considered a **Significant and Unavoidable** impact after implementation of the following mitigation measures.

- **Mitigation Measure AQBIO-A: Maintain Minimum 20-foot Marsh Buffers Along Upland Margins of Alviso Slough.** The interface of marsh habitat with the open water areas is the zone that supports primary macroinvertebrate production and the majority of marsh fish species. Additionally, this interface is the zone where detritus inputs, important to the food web, occur. Minimum marsh buffers of 20 feet wide along the margin of Alviso Slough (from upland edge inward) shall be maintained, to the extent feasible, to ensure that there is minimal net loss in this habitat type (i.e., vegetated marsh edge) or function. The minimum buffer width may be modified through consultation with appropriate resource agencies (e.g., USFWS, NMFS, and CDFG).
- **Mitigation Measure AQBIO-B: Evaluate and Monitor Macroinvertebrate Community Response to Disturbance and Deliver Bi-Annual Reports during and after Initial Construction to the District, NMFS, and other Applicable Resource Agencies for a Period of 3 ~~2~~ years Following Initial Construction.** Prior to and after vegetation removal and dredging activities, The District shall monitor the aquatic macroinvertebrate community in the Project area to identify and measure its response to disturbance in coordination with the NMFS, CDFG, and USFWS and other applicable resource agencies. Prior to and after Project activities, samples of

the macroinvertebrate community shall be taken twice annually (i.e., spring and fall) at two sites that are representative of different habitat conditions (i.e., inundated mudflat and vegetated edge) within the proposed construction area. Additional samples shall also be taken at sites up and downstream of the construction area as reference samples. This data shall be used to augment existing data already collected in the Project area (establish baseline conditions) and to measure change in the community as a result of disturbance. Standardized bioassessment procedures (field and laboratory) shall be used to collect and analyze the macroinvertebrate community. Aquatic macroinvertebrate samples shall be described by sample volume or weight, number of taxa, and relative abundance of dominant taxa. Standard metrics for tolerant/intolerant taxa shall also be used as a proxy for determining general aquatic ecological health. Comparison of data (pre- and post-disturbance) shall include statistical analysis to determine whether a significant change (decline) in abundance or structure has taken place.

Should the monitoring results prove that the community (abundance and structure) has not fully responded after one year from completion of the initial vegetation removal and dredging activities, the monitoring program should be extended to five years. If goals are not met within one year, reoccurring vegetation removal and dredging shall not proceed and the resource agencies will be notified. Investigation of the cause of the decline/lack of response shall be conducted and additional corrections in construction operations shall be made where applicable.

Prior to implementation of the monitoring and evaluation program, a monitoring and evaluation plan shall be developed and provided to the resources agencies for review. The plan shall include details regarding methodology, evaluation, standards, and reporting. If necessary, the methods, standards, and reporting requirements may be revised in coordination with the resource agencies. This mitigation measure may be modified based on additional conditions imposed as part of the required permits from the USACE, RWQCB, USFWS, NMFS, and/or CDFG.

In summary, with implementation of Mitigation Measures AQBIO-A and AQBIO-B, project-related habitat disturbance effects on the macroinvertebrate community would be minimized. Because of the relatively small area of disturbance associated with Alternative 1, potential impacts to the fish community associated with loss or degradation of the macoinvertebrate community would be reduced to less than significant for this alternative, as described earlier. Conversely, due to the increased size, magnitude, and duration of disturbance associated with Alternatives 2 through 5, macroinvertebrate community levels would much less likely to be sustained or be able to recover quickly enough so as to not result in substantial effects to the fish community. Because mitigation would not be able to definitively prevent or avoid substantial disturbance effects on the macroinvertebrate community, potential impacts on the fish community associated with loss or degradation of the macoinvertebrate community would be **Significant and Unavoidable**. This conclusion would be the same for Project Alternatives 2 through 5.

Alternative 6: No Project

No construction would take place under Alternative 6; therefore, there would be no loss or degradation of the macroinvertebrate community. There would be **No Impact**.

Impact AQBIO-5: **Conversion of wetland / marsh aquatic habitat to open water habitat.**

Summary - Common to all Alternatives

Vegetation removal activities would result in the conversion of marsh habitat to both inundated mudflat and open water habitats. There would be an overall decrease in wetland/marsh habitat, but an increase in mudflat and open water areas. Dredging would scour out current benthic habitat, remove vegetation, and potentially displace, or harm the invertebrate and fish species inhabiting the zone. However, benthic habitats would not be removed, but rather altered and placed deeper. Also, there would be an overall increase in the amount of inundated mudflat habitat within the open water channel due to the vegetation removal activities and sediment transport.

Table 3.3-8~~7~~ shows a summary of habitat association and utilization matrix for the Alviso Slough Restoration Project to illustrate predicted positive and negative responses of fish species / life-stage to Project activities that result in a particular habitat conversion. The positive and negative responses of fish / life-stage and Project activities were based on habitat associations and utilizations identified from a review of fish species life history habitat suitability requirements, and attributes and functions of habitats within the Project area. A positive response would be considered a potential benefit for that species / life stage and a negative response would be considered a potential impact for that species / life stage. A discussion of potential effects for each of the primary aquatic habitat types and associated species that would be affected by the proposed Project alternatives is provided below.

Open Water

The Project would cause an overall, albeit relatively small, increase in open water habitat within Alviso Slough. Open water habitat is very important to the aquatic food web in providing exposed surface waters for phytoplankton production, foraging habitat for a variety of fish and invertebrate species at various life stages, and a migration corridor for a number of fish species including CCC steelhead. Compared to historical (pre-1983) conditions, open water habitat has been reduced within the slough due to encroaching marsh vegetation and sediment deposition (see Figure 1-3). It is unknown, due to lack of site-specific data, whether or not the reduced open water habitat in the slough is currently limiting the fish community. Nevertheless, wetland vegetation removal along the channel corridor combined with dredging of the inundated mudflat and/or open water benthos would increase total open water habitat due to greater open water area and/ or channel depth. Species / life-stages that utilize the open water habitat, including plankton, pelagic fish species, and many invertebrate species, could benefit from more open water habitat area. However, many of the open water habitat functions that these species utilize and depend upon do not appear to be limiting factors that are critical for species success. For example, a positive response relationship has been identified for adult steelhead and chinook salmon and open water. This relationship has been identified based on the adult's use of open water during upstream migration. Increased open water would not necessarily improve an individual's success, as physical impediments to migration in the slough are not believed to be limiting. Another example is that many of the more pelagic species identified in the table (e.g., smelt, striped bass) are not merely space limited, but limited by other factors, including food resources, which appear to be driven more by marsh detritus inputs than phytoplankton production in highly turbid systems such as Alviso Slough. Therefore, while there are positive response relationships for many of the species listed in Table 3.3-8~~7~~, these relationships may not be strong (e.g., open water for adult migration) or may be offset by negative relationships for other habitat functions (e.g., decreased open water function due to adverse effects on primary production and the food web).

Inundated Mudflat

Similar to open water habitat, the Project would create an overall increase in inundated mudflat habitat. Mudflats lie below the high-water line and are characterized as supporting minimal emergent vegetation; however, the mudflat area in Alviso Slough has been reduced due to encroaching emergent vegetation. Wetland vegetation removal (proposed at up to 4 feet of root mass) would convert marsh habitat back to mudflat habitat. Extensive communities of invertebrate fauna live within the mudflat substrate, and a variety of fish species move into the area to feed during high tide. Benthic and demersal species including plankton, fish, and many invertebrate species could benefit from more inundated mudflat habitat area. However, the benefits that would result from increased space would be offset by initial and reoccurring disturbance to the benthic macroinvertbrate community. Loss or degradation of the food resources typically associated with the benthic habitat would result in habitat function and value that would be substantially diminished.

Table 3.3-8~~7~~ Summary of Habitat Association and Utilization Matrix for Alviso Slough Restoration Project – Fish Species of Management Concern

Species[1]	Aquatic Habitat Association and Utilization[1, 2]			Management Status[3]
	Marsh	Open Water	Inundated Mudflat	
California Central Coast steelhead *Oncorhynchus mykiss*	- R	+ A	--	SS, N, R
Fall-run chinook salmon *Oncorhynchus tshawytscha*	- R	+ A	--	EFH, SS, N, C, R
Green sturgeon *Acipenser medirostris*	--	+ A, R	+ A, R	SS, N (low probability of occurrence)
Longfin smelt *Spirinchus thaleichthys*	- A, S, R	+ A, R	--	SS, N (low probability of occurrence)
Northern anchovy *Engraulis mordax*	- A, R	+ S, R	+ S, R	EFH, N, C
Topsmelt *Atherinops affinis*	- A, S, R	+ A, R	--	N, C, R
Sacramento sucker *Catostomus occidentalis*	- A, R	+ A, R	+ A, R	N
Longjaw mudsucker *Gillichthys mirabilis*	+ A, S, R	--	+ A, S, R	N, R (bait)
Pacific staghorn sculpin *Leptocottus armatus*	--	+ R	+ A, S, R	N, C
Pacific lamprey *Lampetra tridentata*	- R	+ A	--	N
Threespine stickleback *Gasterosteus aculeatus*	- A, S, R	--	--	N
Striped bass *Morone saxatilus*	--	+ A, R	--	I, R
American shad *Alosa sapidissima*	--	+ A, R	--	I, R
Threadfin shad *Dorosoma petenense*	--	+ A, R	+ A, R	I, C, R (bait)
Yellowfin goby *Acanthogobius flavimanus*	--	+ A, R	+ A, S, R	I, C, R (bait)
Rainwater killifish *Lucania parva*	- A, S, R	--	--	I (forage species)

[1] Life-Stage
A = Adult holding and migration
S = Spawning
R = Rearing (juvenile)

[2] Aquatic Habitat Association Categories
+ = Positive relationship to Project
- = Negative relationship to Project

[3] Management Status Categories
SS = Special-status (NMFS / USFWS / CDFG)
EFH = Essential Fish Habitat designated by NMFS
N = Native
I = Introduced
C = Commercial
R = Recreational

Source: Compiled by EDAW 2007 (see summary species accounts for literature review sources)

Marsh

The increase in emergent wetland vegetation constricting the channel of Alviso Slough has increased marsh habitat along the margins of the channel corridor. The Project would remove large areas of this emergent vegetation to increase the channel width and open water areas in the Project area. This activity would reduce the total marsh area along this segment of Alviso Slough. The edge area, or the interface between open water and marsh habitats, is likely the most important area within the marsh habitat as it provides refuge and structure for many fish species / life-stages along with access to the main channel. The marsh / marsh edge also provides important detritus inputs and is an area that is important for food resources (e.g., macroinvertebrates) production. Detritus inputs, extremely important to the lower trophic levels of the food web, could be reduced depending on the specific footprint for a given alternative, which could result in decreased primary productivity, and a subsequent reduction in primary and secondary consumers. This edge habitat would be set back with vegetation removal and, depending on the particular alternative footprint, would be decreased in size and quality. After the removal activities, a new marsh-open water interface would be present at a setback location in areas or locations where a band of marsh remains. A varying band of marsh would remain in most affected work areas under Alternative 1 through 4; however, Alternative 5 would result in compete marsh removal (including any bands along the margins) throughout most of the affected work area.

As discussed above, organisms associated with the edge marsh habitat could be harmed or displaced from their habitat with vegetation removal. This could be a permanent impact depending on vegetation and dredging maintenance requirements (i.e., the frequency and magnitude of reoccurring activities) and ecological response (i.e., timing and quality).

While there are many uncertainties regarding the habitat value of Alviso Slough for CCC steelhead and chinook salmon, it can be assumed that the marsh edge provides basic functions that are generally recognized as being important for juvenile salmonids. Some of these basic functions include velocity and predator refugia, food production, cover, and to more limited extent, shading and temperature regulation.

Alternatives 1, 2, 3, 4, and 5

Wetland vegetation removal and/or dredging activities associated with Alternatives Nos. 1 through 5 would result in the conversion of wetland/marsh aquatic habitat to open water and inundated mudflat habitats. While these activities could result in potential benefits to those aquatic species / life-stages that primarily utilize open water and inundated mudflat habitats (based on the simple assumption that increased size equals increased benefit), the adverse effects to the food web and those aquatic species that primarily utilize marsh habitats would be considerable. Open water and benthic species, including plankton, pelagic, benthic, and demersal fish species, and many invertebrate species, could benefit from increased open water and inundated mudflat habitat area; however, any potential benefits could be offset by adverse effects to the food web. Marsh fringe associated species and lower trophic levels that are dependent upon marsh-associated detritus inputs would suffer from the reduced marsh habitat area. Initial and reoccurring disturbance associated with project activities would likely result in permanent (on-going) effects to the aquatic community structure as important ecological processes would be continually in flux (i.e., not in equilibrium) under the disturbance and response regime.

While there are uncertainties regarding specific fish abundance, distribution, and overall use of aquatic habitats in Alviso Slough, important attributes of marsh habitat for the fish community (in general) include detritus production and input, aquatic macroinvertebrate production, and habitat diversity, structure, and refugia. Because the proposed project alternatives would result in removal of valuable marsh habitat (conversion to open water and inundated mudflat), this would be an overall adverse impact to the aquatic community. This impact conclusion would apply to Alternatives 1 through 5. Those alternatives with the largest footprint would have the greatest impact (see Table 3.3-9~~8~~ for summary impact acreage totals). Additionally, Alternatives 3, 4, and 5, which include dredging components (in addition to vegetation removal, which is common to all alternatives), would be considered to have an increased level of impact. However, this impact is considered **Less Than Significant with Mitigation** for all alternatives after implementation of the following measures.

- **Mitigation Measure AQBIO-A: Maintain Minimum 20-foot Marsh Buffers Along Upland Margins of Alviso Slough,** applies here.
- **Mitigation TERRBIO-B: 2:1 replacement of tidal wetland habitat.** The restoration of historic tidal marsh habitat within the South Bay at a ratio of 2:1 (e.g., 5.2 acres restored for impacts to 2.6 acres of tidal marsh habitat; see Table 3.3-9~~8~~ for summary mitigation acreage totals) would be implemented to offset the impacts to wetlands from the Project. A 2:1 mitigation ratio is appropriate based on the quality of the habitat that is being impacted and the temporal loss of habitat functions, and values while the mitigation wetlands are developing.

Table 3.3-9~~8~~ Marsh Habitat Impacts and Mitigation Requirements for Each Project Alternative

Project Alternative	Impact on Marsh / Wetlands	Mitigation Ratio	Mitigation Requirement*
Alternative 1	2.6 acres	2:1	5.2 acres
Alternative 2	7.0 acres	2:1	14 acres
Alternative 3	3.7 acres	2:1	7.4 acres
Alternative 4	6.2 acres	2:1	12.4 acres
Alternative 5	15.3 acres	2:1	30.6 acres

*Mitigation Requirement assumes mitigation ratio of 2:1. Actual ratio could vary depending on permit process negotiations with resource agencies.

Numerous feasible mitigation avenues to create 5.2 acres (or greater) of tidal wetland habitat are present in the vicinity, such as at Pond A4. Other mitigation options include contributing to ongoing tidal marsh restoration Projects, such as Pond A6, that are part of the overall SBSP Restoration Project. Additional phases of the SBSP Restoration Project envision restoring tidal marsh in extensive areas of former salt ponds. Mitigation for this Project could occur at one of the future tidal restoration sites, as any tidal wetland restoration within the upper reaches of the Refuge would serve as appropriate in-kind mitigation. Mitigation could take the form of paying an in lieu fee to the restoration program, or implementing a discrete restoration action within the Alviso pond complex. For example, the District funded the restoration of Ponds A19, A20, and A21 as mitigation for their SMP and the LGRP. These types of agreements would require approval from the USFWS as well as the regulatory agencies.

> If the District undertakes a discrete wetland mitigation project separate from the SBSP Restoration Project, a Mitigation and Monitoring Plan (MMP, separate from the MMRP in Chapter 5 of this EIR) shall be prepared outlining the details of the proposed wetland mitigation, and submitted to the regulatory agencies as part of the project's permit application. Mitigation habitat must be tidal wetland habitat (freshwater, brackish, or salt marsh) within the Alviso pond complex of former salt-production ponds, designed to maximize species diversity, to provide high productivity marsh habitat, and to establish habitat values that are similar or greater to that which is being removed.
>
> A monitoring plan shall be developed for any mitigation site planned for this Project to ensure success of the created tidal marsh habitat. The mitigation site shall be deemed successful when the site has achieved a target percent cover by native wetland vegetation (such as the 70 percent cover being targeted by the SBSP Restoration Project within 5 years of reaching the appropriate colonization elevation) with active invasive species control (i.e., treatment of any invasive species that colonizes the site) for at least the first five years. As part of an overall mitigation package, other marsh enhancement opportunities in the Project vicinity would be considered, such as increasing resources in the existing programs for removal of non-native invasive species (e.g., saltmarsh cordgrass (*Spartina alterniflora*) and its hybrids, giant reed (*Arundo donax*)) or the creation or enhancement of high marsh-upland transition areas.

With implementation of Mitigation Measures AQBIO-A ~~G~~ and TERRBIO-B, project-related loss of marsh habitat would be replaced through restoration. Marsh habitat functions and values would be replaced at a ratio of 2:1 (or as approved by resource agencies). Potential impacts associated with loss of marsh habitat would be reduced to less than significant. This conclusion would be the same for all project alternatives.

Alternative 6: No Project

No construction would take place under Alternative 6; therefore, there would be no loss of important marsh habitat. There would be **No Impact**.

Impact AQBIO-6: Impacts related to Mitigation Measure TERRBIO-B, wetland creation.

Summary - Common to Alternatives 1 through 5

Implementation of specific restoration measures associated with the mitigation would result in minimal impacts to existing aquatic habitats. Creation of wetland habitats would primarily involve modifications to the existing hydrology to convert barren salt ponds to vegetated plant communities. Mitigation proposed under TERRBIO-B would constitute such actions as levee breaching, placing fill into former salt ponds, and excavating small pilot channels. These minor impacts would be implemented with the sole intent of restoring large amounts of high quality habitat to offset the wetland impacts from the Project. If mitigation occurs through the SBSP Restoration program, impacts have been addressed under the environmental documentation specific to that project. If the District were to implement its own mitigation program such as at Pond A4, then a separate environmental document would need to be prepared.

Alternatives 1, 2, 3, 4, and 5

The creation of approximately 5.2 to 30.6 acres of wetland habitat in the vicinity of the study area would result in very minor impacts to tidal marsh habitat.

This impact is considered to be **Less than Significant** and no mitigation is proposed.

Alternative 6: No Project

Under the No Action Alternative, no mitigation activities would occur. No mitigation is required for this alternative as there is **No Impact** under this alternative.

Impact AQBIO-7: **Increased entrainment of fish species into Pond A8.**

Summary - Common to all Alternatives

The existing weir (under the existing condition) currently has the potential to entrain fish, including downstream migrating juvenile CCC steelhead and chinook salmon smolts, during high flow periods when fish are present and when flood waters are spilling from Alviso Slough into Pond A8. Pond A8 is a closed system and water quality in the pond is not suitable for salmonids; therefore, all juvenile steelhead and chinook salmon entrained into Pond A8 during high flow events would be permanently lost. The weir was originally designed (as part of the LGRP) to ~~pass~~ divert a portion of flows from Alviso Slough into Pond A8 to not exceed limited channel conveyance capacities downstream of the Alviso County Marina, thus providing up to ~~maintain~~ one-percent ~~design flow~~ flood protection for the community of Alviso. At the time of the initial design approval for the weir, NMFS conducted an ESA Section 7 consultation with USACE and the District for the LGRP (and associated Pond A8 weir). During this consultation, measures were developed to minimize the loss of emigrating steelhead and chinook salmon during flood events. Specifically, the weir at Pond A8 was designed to allow overflow from Alviso Slough as infrequently as possible (limiting overtopping to a nine-year or greater storm event) to minimize the loss of fish entrained therein.

Recent hydraulic modeling conducted by the District (Appendix IV) ~~(2007)~~ simulated conditions under the original 2002 design condition and the more current 2005 hydraulic baseline ~~surveyed~~ conditions, with a peak flow of 18,350 cubic feet per second (cfs) (one-percent design flow) in Alviso Slough downstream of the UPRR bridge. This hydraulic modeling indicated that under the original 2002 design condition, about 8,500 cfs ~~46 percent~~ of the peak flow in Alviso Slough would overtop the Pond A8 weir, and about 9,800 cfs ~~54 percent~~ would be conveyed down the slough to the Bay. Since that time, vegetation has narrowed the open water width in the slough downstream of the weir, which would cause high flows to back up and force more flow over the weir. Based on 2005 hydraulic baseline ~~surveyed~~ conditions, the modeled flow split would reverse, with about 10,000 cfs ~~55 percent~~ of the peak flow going over the weir, and the remaining 8,300 cfs ~~45 percent~~ conveyed along Alviso Slough to the Bay.

Alternatives 1, 2, 3, 4, and 5

Implementation of Alternative Nos. 1 through 5 would affect flow conveyance conditions in Alviso Slough between Gold Street and the Alviso County Marina, the reach of Alviso Slough that is adjacent to ~~downstream of~~ the Pond A8 weir. These changes in channel conveyance conditions would not change the frequency of weir overflow events, but would ~~in turn,~~ change the flow split function of the Pond A8 weir under high flow conditions (see Table 3.3-10~~9~~ for modeling results for the one-percent, or 100-year event). The information presented in this table indicates that each of the proposed alternatives would result in higher flows being conveyed in Alviso Slough than the 2005 hydraulic baseline channel capacity (8,300 cfs). Lowering of the weir (to varying degrees depending on project alternative) would maintain the 2005 hydraulic baseline ~~current~~ flow split condition of 10,000 cfs peak flow spilling to Pond A8 and 8,300 cfs peak flow conveyed downstream via Alviso Slough. ~~and accommodate changes in downstream conveyance associated with each of the project alternatives.~~

Table 3.3-10~~9~~ Modeled One-Percent Event Flow Split Between Pond A8 and Alviso Slough by Original Design (Permit), Surveyed (2005), and Project Alternative Conditions

Condition	Peak Flow to Pond A8 (cfs)[1]	Peak Flow in Alviso Slough (cfs)[1]
2002 Design (Permit)	8,500	9,800
2005 (Actual)	10,000	8,300
Alternative 1 (Modeled)	9,800	8,500
Alternative 2 (Modeled)	9,400	8,900
Alternative 3 (Modeled)	9,600	8,700
Alternative 4 (Modeled)	8,900	9,400
Alternative 5 (Modeled)	9,000	9,300

[1] Modeled flow split between Pond A8 and Alviso Slough is based on total peak flow in one percent event (18,300 cfs).

Source: SCVWD 2007

The weir at Pond A8 was designed to allow outflow from Alviso Slough as infrequently as possible to minimize the loss of fish entrained into Pond A8. Because lowering of the weir would maintain the 2005 hydraulic baseline ~~existing~~ flow split between the Pond A8 weir and Alviso Slough, impacts to fish would be minimized. This impact conclusion would be the same for each of the project alternatives (Nos. 1 through 5) because the degree to which the weir would be lowered would be based on hydraulic modeling with the objective to maintain the 2005 ~~current~~ flow split function. Because weir modifications (lowering) for each of the alternatives would be designed to achieve the same flow split, potential fish entrainment effects would be the same. This impact is considered **Less Than Significant with Mitigation** after implementation of the following measure.

- **Mitigation Measure HYD-A: Lower Pond A8 weir.** The District shall lower the Pond A8 weir to maintain the 2005 hydraulic baseline ~~existing~~ flow split between the Pond A8 weir and Alviso Slough, thereby maintaining 2005 hydraulic baseline ~~existing~~ flows and levels of flood protection downstream of the site during flood events. As described in Appendix IV, the District ~~(2007)~~ performed hydraulic modeling for each alternative to estimate the extent to which the Pond A8 weir would need to be lowered to maintain the flow split estimated for the 2005 hydraulic baseline ~~existing~~ conditions. Model results indicate that the existing weir at Pond A8 would need to be lowered to the dimensions listed in Table 3.1-3 to maintain the 2005 hydraulic baseline ~~existing~~ flow split for Alternatives 1 through 5.

With implementation of Mitigation Measures HYD-A, the 2005 hydraulic baseline ~~current~~ flow split at the Pond A8 weir would be maintained. Because lowering of the weir would maintain the 2005 hydraulic baseline ~~current~~ function of the weir, any potential impacts to fish would be minimized. Potential impacts associated with entrainment of fish in Pond A8 would be reduced to **Less Than Significant**.

The anticipated 2009 installation of a notch to introduce a muted tidal regime in Pond A8 as part of the SBSP Phase 1 Actions, may dramatically improve the fate of endangered species that may be entrained in Pond A8 during a high flow event. The District plans to closely coordinate with USFWS in the latter's operation of the notch. Currently, USFWS plans to close the notch in the winter. If a high flow event were to occur, and Alviso Slough flows would overtop the Pond A8 weir, the notch could be opened after the storm event passes to assist the draining of the pond complex. In such a case, if endangered species were entrained in the pond during the overflow event, they could safely make their way back to Alviso Slough via the opened notch. This would substantially reduce the potential mortality of entrained species during the rare events when overflows to Pond A8 may occur.

Alternative 6: No Project

No construction would take place under Alternative 6; therefore, the 2005 hydraulic baseline ~~existing~~ flow split condition would remain. There would be **No Impact**.

Impact AQBIO-8: **Impacts related to increased boat use.**

Alternatives 1, 2, 3, 4, and 5

Improved recreational access to Alviso Slough is an important objective of the Alviso Slough Restoration Project (see Section 1.2.3). Such access is important to the quality of life of Alviso residents and visitors. However, increased boat use has the potential to adversely affect the fish community~~, increase shoreline erosion,~~ and result in the direct or indirect loss or degradation of habitat ~~along the edge of~~ in Alviso Slough. Increased boat traffic has the potential to increase shoreline erosion (summarized in Asplund 2000), resulting in the direct or indirect loss of marsh habitat along the edge of Alviso Slough. Boat traffic also has the potential to increase turbidity in water bodies for several hours after boating ceases (Yousef et al. 1980, Hilton and Philips 1982). Increased turbidity in Alviso Slough could disrupt normal patterns of foraging and migration for steelhead and other fish species.

Despite the additional boat use associated with access to the existing SBYC boat dock, the Project is not expected to significantly increase shoreline erosion or disrupt steelhead behavior. However, see Section 4.2.2 for cumulative impacts associated with the Project and other foreseeable projects in the Alviso Slough area. ~~Nevertheless, the additional amount of boating in Alviso Slough facilitated by the proposed Project is not expected to substantially increase boat use or boat wake impacts on the adjacent marshes and those species that utilize the marshes.~~

This impact is considered to be **Less than Significant** and no mitigation is proposed.

Alternative 6: No Project

Under Alternative 6, no mitigation is required for this alternative as there is **No Impact** under this alternative.

3.3.4 Relationship to South Bay Salt Ponds Phase 1 Action at Pond A8

This section describes the impacts of the project alternatives assuming the SBSP Phase 1 Action at Pond A8 is implemented and successful.

As part of the SBSP Phase 1 Action at Pond A8, an armored "notch" along the perimeter levee of Pond A8 would provide limited tidal exchange to upper Alviso Slough and a series of flashboard weirs would allow for an adjustable flow area, such that the amount of tidal exchange could be adjusted, and possibly eliminated to prevent unacceptable long-term adverse ecological impacts. Initial notch operations would likely consist of an approximately 20-foot wide opening. Based on observed erosion of downstream fringing marshes and the potential for scour of perimeter levees with the 20-foot notch, the notch width may increase up to approximately 40 feet, or the notch may be closed seasonally or permanently.

The proposed notch would cause partial restoration of the tidal prism through Ponds A8, A5, and A7, and would promote channel scour along the upper (landward) half of Alviso Slough downstream of the notch. Changes to the existing channel width are expected to be greatest in the vicinity of the notch and diminish downstream. Based on modeled hydraulic geometry results for the SBSP Restoration Project, 20-foot and 40-foot wide notch openings at Pond A8 would widen the current channel width by approximately 50 to 90 feet, respectively, in the vicinity of the SBYC. Modeling results and hydraulic geometry analysis suggest that implementation of the proposed SBSP Phase 1 Action at Pond A8 would not result in measurable changes to the channel width along the downstream (bayward) half of the slough – downstream of the Alviso Slough Restoration Project area.

Implementation of the proposed SBSP Phase 1 Action at Pond A8 would restore a more natural process of tidal scour that would, at least partially, deter re-establishment of marsh vegetation. The degree of sustainability would depend on the ability to increase notch operations from an initial 20-foot wide opening up to 40-feet wide over the lifetime of the SBSP Phase 1 Action; sustainable open channel area could be limited to approximately 50-feet (versus 90-feet), if operation of the Phase 1 notch does not progress toward a 40-foot opening.

The location of the Phase 1 notch would have important implications for vegetation and aquatic habitat conditions in the Project area. Preliminary selection of the notch location places the notch immediately upstream (landward) of the boats docks near the SBYC, which would maximize scour around the existing SBYC docks. Due to the relatively large difference in water levels between Pond A8 and Alviso Slough at higher high and lower low tides, current velocities are expected to be strong in the immediate vicinity of the notch. Localized turbulence is expected to result in greater changes to channel width, compared to other locations, due to erosion along the channel bank opposite the notch. Depending on the degree of scour, this could potentially achieve project objectives for the Alviso Slough Restoration Project. Over the long-term (10 years and beyond), future SBSP Restoration Project phases would further increase the width of Alviso Slough channel, if Pond A8 were restored to full tidal action as planned.

Restoration of more natural physical and chemical processes (e.g., sediment transport and deposition, salinity gradients, etc.) in the slough through implementation of the SBSP Pond A8 Phase 1 Action would be expected to generally improve habitat functions and values in the slough (e.g., cover, structure, food web production, nutrient and materials exchange, etc.), ultimately benefiting the fisheries and macroinvertebrate communities.

Impact AQBIO-1: Construction-related increases in sediments and turbidity.

Summary - Common to all Alternatives

Impact AQBIO-1 could be reduced if the SBSP Phase 1 Action precedes the Alviso Slough project and scours some of the existing slough and associated marsh prior to implementation of this project, thereby reducing the extent of vegetation removal and/or dredging activities and associated impacts. Furthermore, the vegetation removal and/or channel deepening under this scenario could be maintained (to some extent) by scour from the SBSP Phase 1 Action for the life of that project, and thus future impacts from subsequent maintenance activities would be reduced. Nevertheless, while the extent of impact area would vary by project alternative, impact conclusions would remain the same (as described above) for all alternatives and impact mechanisms.

Impact AQBIO-2: Release and exposure of construction-related contaminants.

Summary - Common to all Alternatives

Impact AQBIO-2 could be reduced if the SBSP Phase 1 Action precedes the Alviso Slough project and scours some of the existing slough and associated marsh prior to implementation of this project, thereby reducing the duration of vegetation removal and/or dredging activities and potential for impacts associated with equipment operation within or near the water. Nevertheless, while the duration of the potential impact would vary by project alternative, impact conclusions would remain the same (as described above) for all alternatives and impact mechanisms.

Impact AQBIO-3: Construction-related release and exposure of legacy contaminants in sediments.

Summary - Common to all Alternatives

Impact AQBIO-3 could be reduced if the SBSP Phase 1 Action precedes the Alviso Slough project and scours some of the existing slough and associated marsh prior to implementation of this project, thereby reducing the amount of legacy contaminants that would otherwise be exposed and released. Nevertheless, while the amount of legacy contaminants that would be released and exposed would vary by project alternative, impact conclusions would remain the same (as described above) for all alternatives.

Impact AQBIO-4: Construction-related habitat disturbance.

Summary - Common to all Alternatives

Impact AQBIO-4 could be reduced if the SBSP Phase 1 Action precedes the Alviso Slough project and scours some of the existing slough and associated marsh prior to implementation of this project, thereby reducing the amount of habitat disturbance (associated with vegetation removal and dredging) that would otherwise be required. Nevertheless, while the amount of habitat disturbance would vary by project alternative, impact conclusions and proposed mitigation would remain the same (as described above) for all alternatives.

Impact AQBIO-5: **Conversion of wetland / marsh aquatic habitat to open water habitat.**

Summary - Common to all Alternatives

Impact AQBIO-5 could be reduced if the SBSP Phase 1 Action precedes the Alviso Slough project and scours some of the existing wetland / marsh habitat prior to implementation of this project, thereby reducing the amount of wetland / marsh habitat that would otherwise be converted to open water. Nevertheless, while the amount of habitat conversion would vary by project alternative, impact conclusions and proposed mitigation would remain the same (as described above) for all alternatives.

Impact AQBIO-6: **Impacts related to Mitigation Measure TERRBIO-B, wetland creation.**

Summary - Common to all Alternatives

Impact AQBIO-6 could be reduced if the SBSP Phase 1 Action precedes the Alviso Slough project and scours some of the existing wetland / marsh habitat prior to implementation of this project, thereby reducing the amount of wetland / marsh habitat that would otherwise be converted to open water and reducing associated mitigation requirements. Nevertheless, while the amount of habitat mitigation requirement would vary by project alternative, impact conclusions would remain the same (as described above) for all alternatives.

Impact AQBIO-7: **Increased entrainment of fish species into Pond A8.**

Summary - Common to all Alternatives

Impact AQBIO-7 would be the same regardless of implementation of the SBSP Phase 1 Action. The impact conclusions and proposed mitigation would remain the same.

Impact AQBIO-8: **Impacts related to increased boat use.**

Summary - Common to all Alternatives

Impact AQBIO-8 would be the same regardless of implementation of the SBSP Phase 1 Action because boat use is not expected to increase substantially as a result of implementation of the proposed project. The impact conclusions would remain the same.

3.3.5 Sediment Disposal Options

Sediment disposal options include trucking, barging or conveying (e.g., slurry pipe) the dredged sediment to a location where it could be re-used, rather than trucking the material to the Newby Island landfill, as described in Chapter 2. These disposal options would result in similar temporary construction-related impacts as considered above and would require the same mitigation measures. The barging option could provoke additional or slightly different impacts to fisheries and water quality, and additional mitigation requirements could therefore be required. However, a re-use solution where the sediment would not require drying at the proposed staging areas in Alviso would alleviate potential impacts to resources associated with staging areas.

If chemical testing of sediments proves that sediment chemistry (including contaminant concentrations), is acceptable for the reuse of the material in a beneficial manner (e.g., wetland restoration), then this long-term impact would be considered beneficial and no mitigation would be required.

3.4 BIOLOGICAL RESOURCES – TERRESTRIAL (TERRBIO)

This section characterizes the key issues and the potential impacts of the alternatives related to terrestrial biological resources.

3.4.1 Regulatory Setting

Table 3.4-1 shows the pertinent regulations that are relevant to the biological resources of the Alviso Slough Restoration Project area.

Table 3.4-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
FEDERAL	
USACE *Waters of the U.S. Regulations Overview*	All proposed work and/or structures extending bayward or seaward of the line on shore reached by mean high water in tidal water or ordinary high water in non-tidal waters designated as navigable waters of the U.S. must be authorized by the USACE. In addition, impacts to wetlands identified using the *Corps of Engineers Wetlands Delineation Manual Environmental Laboratory 1987*) and the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (*Regional Supplement* USACE 2006) require authorization from the USACE. A Jurisdictional Determination (JD) for the Alviso Slough Project area (the portion of the Lower Guadalupe River and Alviso Slough from the Gold Street Bridge to immediately downstream of the former marina) was issued on January 17, 2001 (file number 24897S) and expired on January 17, 2006. Existing conditions have since changed and an update was requested on October 24, 2006. This update request included a map of Potential Waters of the U.S. for the study area including 28.7 acres of 404 Wetlands and 3.9 acres of Other Waters. No JD for the Project area has been issued since this request was made.
U.S. EPA *CWA* *State Wetlands Programs*	U.S. EPA is responsible for the development and approval of the standards, criteria, and effluent guidelines that govern impacts to the Nation's waters under the CWA. U.S. EPA approves state water quality standards in accordance with the Act, which are achieved primarily through programs administered by the states. U.S. EPA also fosters the development of state wetlands programs, as well as provides environmental standards and oversight for the administration of the wetlands permit program under section 404 of the Act (including veto authority). Any impacts to Section 404 wetland habitat proposed for the project requires approval by the USACE, as described above.
USFWS *Federal Endangered Species Act (FESA)*	See Section 3.3 for a discussion of FESA. The Alviso Slough Restoration Project EIR addresses the probability of occurrence of seven federally listed special-status animal species.
USFWS *Federal Migratory Bird Treaty Act*	The Federal Migratory Bird Treaty Act (16 USC Sec. 703) prohibits killing, possessing, or trading in migratory birds except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs. Several bird species protected by the Act may occur within the Alviso Slough Restoration Project area.
USFWS, National Marine	The 1972 Marine Mammal Protection Act (16 USC Sec. 1361-1407) was

Table 3.4-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
Fisheries Service *Marine Mammal Protection Act*	enacted to conserve marine mammals, including cetaceans, pinnipeds, and other marine mammal species. With certain exceptions, the Act prohibits the taking and importation of marine mammals as well as products taken from them. Relevant to the Alviso Slough Restoration Project, this Act prohibits harassment of marine mammals, including the harbor seal. No marine mammals are expected to be affected by the Alviso Slough Restoration Project.
Executive Order 11990	Executive Order 11990 was signed by President Jimmy Carter in 1977, in furtherance of the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.), to avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative. The Alviso Slough Restoration Project, with the mitigation measures described below, will comply with this executive order as all practicable alternatives are assessed below.
Federal "No Net Loss" and Net Wetland Increase Policies	In 1998 and 1990, President George H. W. Bush presented a Federal policy for a national no net loss of wetlands. In 2004, President George W. Bush, Jr. declared a Federal policy to attain an overall increase in quantity and quality of wetlands. The Alviso Slough Restoration Project, with the mitigation measures described below, will comply with these policies.
National Wildlife Refuge System Administrative Act of 1966 and its Amendments (NWRSAA)	The NWRSAA is the federal law establishing wildlife conservation requirements and jurisdiction of public lands and waters held as National Wildlife Refuges. This Act is included in this section given the project's immediate proximity to the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge). This Act constitutes an "organic act" for the National Wildlife Refuge System. It was recently amended by P.L. 105-57, "The National Wildlife Refuge System Improvement Act of 1997." On October 9, 1997, President Clinton signed the National Wildlife Refuge System Improvement Act of 1997 into law. This new law amends and builds upon the National Wildlife Refuge System Administration Act of 1966 to ensure that the National Wildlife Refuge System is managed as a national system of related lands, waters, and interests for the protection and conservation of our Nation's wildlife resources. The Act's main components include: a strong and singular wildlife conservation mission for the Refuge System; a requirement that the Secretary of the Interior maintain the biological integrity, diversity and environmental health of the Refuge System; a new process for determining compatible uses of refuges; a recognition that wildlife-dependent recreational uses involving hunting, fishing, wildlife observation and photography, and environmental education and interpretation, when determined to be compatible, are legitimate and appropriate public uses of the Refuge System; that these compatible wildlife-dependent recreational uses are the priority general public uses of the Refuge System; and a requirement for preparing comprehensive conservation plans.
STATE	
CDFG *California Endangered Species Act (CESA)*	See Section 3.3 for a discussion of the CESA. The probability of occurrence of 35 species that are California State Listed or California Species of Special Concern within the Alviso Slough Restoration Project area is described below.

Table 3.4-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
California Fish and Game Code 2070	
California Department of Fish and Game (CDFG) Jurisdiction *Section 3511, 4700, 5050, and 5515 of the Fish and Game Code*	CDFG does not claim jurisdiction over saltwater habitats including diked, muted, and salt or brackish tidal marsh similar to that found within the Alviso Slough Restoration Project area (Section 1600-1607). However, CDFG staff has indicated that a Streambed Alteration Agreement may be required for this project. Other sections of the Fish and Game Code of California protect various groups of wildlife species designated as "fully protected", including fish, crustaceans, mollusks, birds, mammals, reptiles, and amphibians (California Fish & Game Code §§ 3511{birds], 4700 [mammals], 5050 [reptiles and amphibians], 5515 [fish]). ~~In preliminary discussions with CDFG staff,will not require a Streambed Alteration Agreement for the Alviso Slough Restoration Project area was found to be not required. However, Fish and Game Code relative to protected species do apply.~~ The probability of occurrence of 35 species that are California State Listed or California Species of Special Concern within the Alviso Slough Restoration Area Project area is described below.
California State Lands Commission	The State Lands Commission ("Commission") has jurisdiction and management control over those public lands of the State received by the State upon its admission to the United States in 1850 ("sovereign lands"). Generally, these sovereign lands include all ungranted tidelands and submerged lands, beds of navigable rivers, streams, lakes, bays, estuaries, inlets, and straits. Portions of the project are located on lands currently leased to the Santa Clara Valley Water District and South Bay Yacht Club along Alviso Slough. Staff of the Commission has been working with the Santa Clara Valley Water District regarding the proposed project and it is understood that an application to amend their lease will be necessary.
San Francisco Bay Conservation and Development Commission (BCDC) *Federal Coastal Zone Management Act* *California Coastal Act* *McAteer-Petris Act* *San Francisco Bay Plan*	The San Francisco BCDC is a California state agency. BCDC jurisdiction in the Project area extends over the bay, up to mean high tide and to five feet above mean sea level in marshes; and over a 100-foot shoreline band inland from the line of mean high tide or the line five feet above mean sea level adjacent to marshes occurring within San Francisco Bay. The BCDC also has certain waterway jurisdiction in the Project area, along Alviso Slough in Santa Clara County. Two construction staging areas, (1. SCVWD and 2. Pellegrini) are within the Commission's 100 foot shoreline band jurisdiction and permits would be necessary. The BCDC does not have 100-foot shoreline band jurisdiction adjacent to its certain waterway jurisdiction. The BCDC also has jurisdiction over all areas which have been diked off from the bay and have been used during the 3 years from August 1966 to August 1969 for the solar evaporation of bay water in the course of salt production. BCDC is responsible for enforcing the McAteer-Petris Act, which requires that maximum feasible public access, consistent with a project be included as part of each project to be approved by the BCDC. BCDC is also responsible for determining consistency with the federal Coastal Zone Management Act. The Federal Coastal Zone Management Act and the California Coastal Act require the BCDC to review federal projects, projects that require federal approval, or projects that are supported by federal funds. The BCDC San Francisco Bay Plan (Bay Plan) promotes Bay conservation along with

Table 3.4-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
	shoreline development and public access. The Alviso Slough Restoration Project would require a BCDC Major Permit or consistency determination for dredging and filling, shoreline improvements, or substantial changes in use.
California State Coastal Conservancy *San Francisco Estuary Invasive Spartina Control Program*	The *Spartina* Control Program (Control Program) is in the process of implementing a coordinated, region-wide eradication program, comprising a number of on-the-ground treatment techniques to stave off a San Francisco Bay invasion of nonnative cordgrass. The Control Program would be focused within the nearly 40,000 acres of tidal marsh and 29,000 acres of tidal flats that comprise the shoreline areas of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma, and Sacramento Counties. Alviso Slough, including the proposed Project area, is included in Project areas defined by the Control Program.
California Native Plant Society (CNPS) *Plant species of concern*	The CNPS, a non-governmental conservation organization, has developed lists of plant species of concern in California. Vascular plants included on these lists are defined as follows: List 1A Plants considered extinct. List 1B Plants rare, threatened, or endangered in California and elsewhere. List 2 Plants rare, threatened, or endangered in California but more common elsewhere. List 3 Plants about which more information is needed - review list. List 4 Plants of limited distribution-watch list. Although the CNPS is not a regulatory agency and plants on these lists have no formal regulatory protection, plants appearing on List 1B or List 2 are, in general, considered to meet CEQA's Section 15380 criteria and adverse effects to these species are considered significant. Of the 47 CNPS-listed species that occur within Santa Clara County, only 13 occur within habitat types similar to those found within the Project area. Of these, only Congdon's tarplant has any potential for occurrence within the Project area.
California Wetlands Conservation Policy *Department of Fish and Game* *The Resources Agency* *Department of Food and Agriculture* *Cal-EPA* *SWRCB*	The California Wetlands Conservation Policy was adopted on 23 August 1993 to establish a policy framework and strategy that will ensure no overall net loss of wetlands and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California; reduce procedural complexity in the administration of State and Federal wetlands conservation programs; and encourage partnerships to make landowner incentive programs and cooperative planning efforts the Primary focus of wetlands conservation and restoration. The Governor also signed Executive Order W-59-93, which incorporates the goals and objectives contained in the new policy. The Alviso Slough Restoration Project, with the mitigation measures described below, will comply with this policy. No other California Wetland Policies are applicable to the project.

Table 3.4-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
LOCAL	
San Jose 2020 General Plan ("General Plan"), which incorporates the Alviso Master Plan: A Specific Plan for the Alviso Community *Comprehensive Conservation and Management Plan (CCMP) for the San Francisco Estuary (Draft CCMP 2007)* *San Francisco Baylands Ecosystem Habitat Goals Report* *The San Francisco Bay Plan (SFBP) developed by BCDC*	All of these policies support the preservation, enhancement and restoration of tidal marsh habitats. Impacts to these habitats must be justified with a clear purpose and need, the impacts minimized, and mitigation provided. The Alviso Slough Restoration Project, with the mitigation measures described below, will comply with these policies.

3.4.2 Physical Setting

Methodology

This section characterizes the existing terrestrial and wetland biological conditions related to the Alviso Slough Restoration Project. The principal biological components of concern are the vegetation and habitats, wildlife, and the area of jurisdictional habitat (e.g., wetlands and/or Waters of the U.S.). A substantial amount of data on wildlife use of the South Bay has been collected by resource agencies such as USFWS, CDFG, and USGS, non-profit organization and research groups such as PRBO Conservation Science (PRBO) and the San Francisco Bay Bird Observatory (SFBBO), consultants, researchers, and private individuals. The information contained in this report is summarized primarily from the SBSP 2005 Biology and Habitats Existing Conditions Report, as well as the Alviso Slough Problem Definition and Refined Objectives Report (EDAW 2007). Additional information comes from numerous wildlife surveys performed by the District as part of the LGRP and associated technical studies.

Regional

The San Francisco Bay Estuary (the Estuary) is the largest estuary on the west coast of North America and is an extremely productive, diverse ecosystem (Trulio et al 2004). Despite the loss of more than 90 percent of historic tidal wetlands in the Bay Area to diking, draining, and filling (Goals Project 1999; Harvey et al. 1988), wildlife diversity is high. The South Bay is a vital component of the larger Estuary. The South Bay supports some of the most important habitat remaining in the entire Bay Area for a number of wildlife species, in spite of the highly urbanized surrounding areas and the dramatic alteration of the Bay itself for shipping, salt production, and urban development (Goals Project 1999).

The term "South Bay" refers to the portion of San Francisco Bay south of Coyote Point on the western shore and San Leandro Marina on the eastern shore (Goals Project 1999). This region differs in several physical and ecological aspects from the Central Bay, North Bay, San Pablo Bay and Suisun Bay, and the Delta portions of the San Francisco Bay Estuary. The habitats included in the South Bay are open waters to the upper reaches of tidal action, the tidal and nontidal wetlands and former salt evaporation ponds adjacent to the Bay, and the upland areas immediately adjacent to these features (see Figure 3.4-1). The South Bay area is bordered by the Central Bay to the northwest and is surrounded by urban development on all other sides. While the South Bay area is larger than the actual Alviso Slough Restoration Project area, a landscape-level description of the South Bay is important when considering restoration options and their concomitant benefits and impacts. Included in this regional setting section are descriptions of the various biological habitats that occur in the Alviso Slough Restoration Project area.

More than 250 species of birds, 120 species of fish, 81 species of mammals, 30 species of reptiles, and 14 species of amphibians regularly occur in the San Francisco Estuary (Siegel and Bachand 2002). Equally important, the Estuary supports populations of species that are of regional, hemispheric, or even global importance. A number of endemic, endangered, threatened, and rare wildlife species or subspecies reside within the San Francisco Bay Area. The diversity of habitat types, particularly within the South Bay, is largely responsible for the diversity of wildlife species that occur, while the high productivity of these habitats allows those species that are not habitat limited to achieve substantial numbers. Tidal salt marshes and open waters that sustain aquatic plants and phytoplankton, as well as salt ponds that sustain high biomass of invertebrates, are the basis of the Estuary's complex and productive food web.

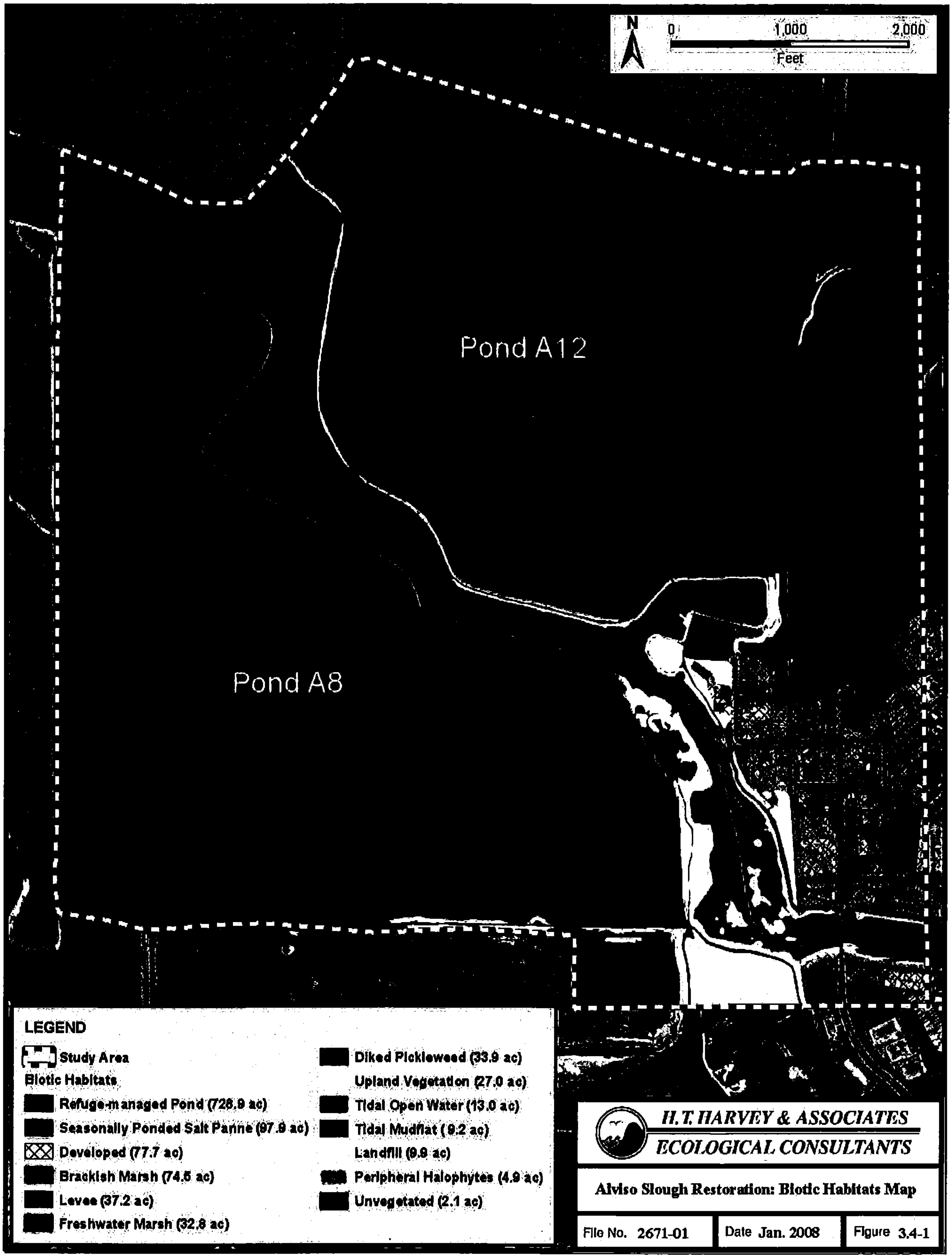
The San Francisco Bay Estuary formed as sea level rose through the Golden Gate approximately 10,000 years ago (Atwater 1979; Atwater et al. 1977). As sea level rise slowed approximately 3,000 years ago, vegetation began to colonize and persist on the tidal mudflats along the estuarine margins (Atwater et al. 1979; Collins and Grossinger 2004). Collins and Grossinger (2004) describe three major types of historic South Bay wetland landscapes:

- Saline tidal marshes with high channel density, abundant marsh pans and salinas[1], moist grasslands along the backshore, large sausals[2], and extensive tidal flats;
- Riparian tidal marshes existing along a salinity gradient from fresh to brackish to saline waters, and influenced by inputs from Coyote Creek and the Guadalupe River. These areas had large marsh pans and a moderate density channel network in the vicinity of major freshwater sources; and
- Salt pond landscapes comprising tidal marshlands dominated by salt ponds. These areas comprised roughly equal areas of tidal marsh and salt pond, with minimal tidal channel network development. Small salinas and marsh pans were adjacent to the salt ponds, with moist grasslands occurring along the backshore.

---

[1] Salinas are natural impoundments of tidal water less than 30 cm deep on the high marsh plain.

[2] Sausals (termed by Spanish explorers) are groves of willows on flat lands, often associated with creeks that are sustained by springs, seeps, or a shallow water table.



Alviso Slough Restoration: Biotic Habitats Map

Figure 3.4-1

Many of these historic habitats have been dramatically modified by anthropogenic activities including dredging, agriculture, salt production, and flood protection. The ecology of the South Bay wildlife habitat is currently characterized by:

- High productivity of tidal marshes, with export of organic matter to tidal sloughs, channels, and mudflats, and to the Bay, supporting high abundance of invertebrates, fish, and birds;
- High productivity of a portion of the former and current salt ponds, supporting an abundance of invertebrates in higher-salinity ponds and high numbers of fish in lower-salinity ponds, but with virtually no export of organic matter to other habitats aside from variable (and at times, very heavy) use of the salt ponds by birds;
- Tidal habitats that support an invertebrate community dominated by nonnative species;
- High use of the South Bay habitats by waterbirds, including significant proportions of breeding and migratory shorebird and waterfowl populations;
- Highly dynamic bird and fish communities, with use of different areas varying several times a day with tide height, and with abundance and community composition varying seasonally depending on migration, precipitation, temperature, salinity, and other factors. In particular, large numbers of shorebirds forage on intertidal mudflats at low tide and use salt ponds and other alternative habitats (e.g., water treatment plant ponds) for roosting and/or foraging particularly at high tide;
- The presence of rare San Francisco Bay endemics, including the California clapper rail (*Rallus longirostris obsoletus*), salt marsh harvest mouse (*Reithrodontomys raviventris raviventris*), and salt marsh wandering shrew (*Sorex vagrans halicoetes*) in remnant tidal marsh habitat (see Table 3.4-4 for a full list of species and their Federal and State designations); and
- Small, isolated tidal salt-marsh remnants, with very limited escape cover for salt marsh harvest mice and salt marsh wandering shrews.

Study Area

The Alviso Slough Restoration Project area includes the portion of the Alviso Slough between the Gold Street Bridge and directly downstream of the Alviso Slough Marina. For the purposes of this EIR, the study area encompasses also Ponds A8 and A12 adjacent to the Project area (Figure 3.4-1). The historical context of the study area and its current biological conditions are described below.

Historic Biological Conditions at the Alviso Slough Restoration Project Area

Historically, tidal marshes were the dominant habitat throughout much of the South Bay. The vast area dominated by marshes included Alviso Slough, in the lower reaches of the Guadalupe River. The Slough, subject to tidal action, had abundant water flow in from, and out to, the Bay. This water flow continually scoured the channel and kept it relatively free of sediment build-up. Prior to the 1940s, Alviso Slough was a broad channel with an extensive salt marsh on either side. After levees were built in the 1940s to create salt ponds, the dynamics of water flow in the channel began to change. The levees sealed off much of the South Bay from tidal action and in turn water flow in the Slough decreased, causing the channel to fill in with sediment.

In the 65 or so years since the construction of the levees, Alviso Slough has undergone dynamic changes, both physical and biological. After the levees were built, groundwater pumping led to subsidence throughout the region. As a result, land around the town of Alviso sank up to 10 feet. In the Slough, this sinking caused the channel to deepen to a point where it could no longer sustain marsh plants. Additionally, the levees themselves sank. The District and the salt pond operators repeatedly raised the height of the levees to counteract this trend. Subsidence began to slow starting in 1965 and the channel slowly refilled with sediment, though it took years for marsh plants to reestablish. The resulting newly established vegetation helped accelerate the process of sedimentation.

Figure 3.4-2 presents the estimated channel width over time, based on historical aerial photographs (aerial photographs shown in Figure 1-3).

Figure 3.4-2 Alviso Slough Channel Cross-Section Widths, 1939-2004

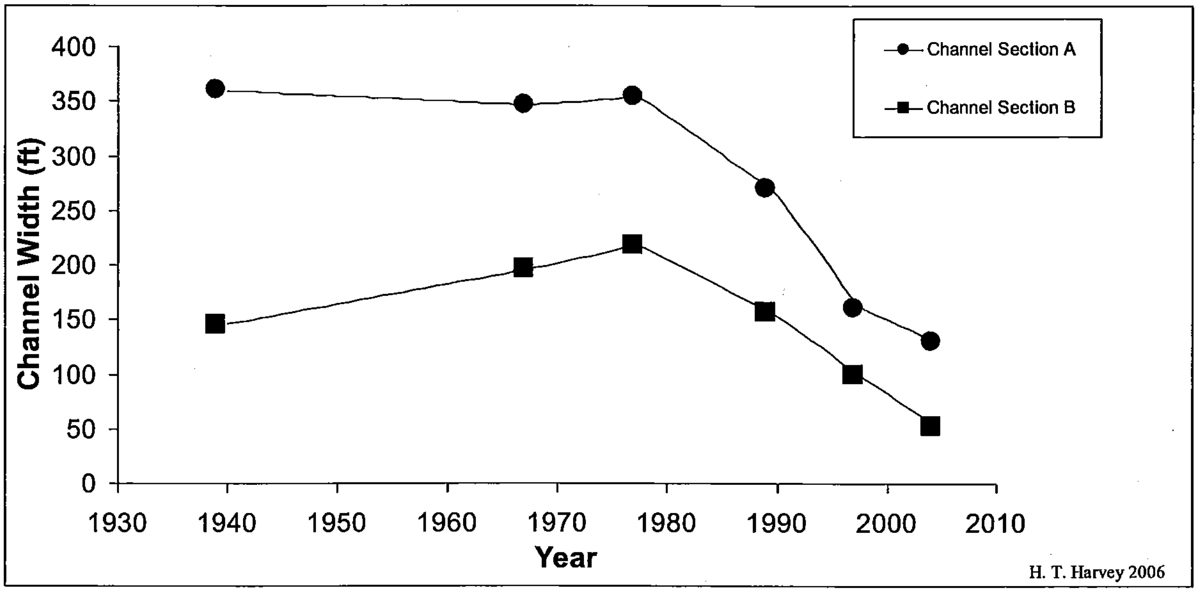


Figure 3.4-2 shows a sharp downward trend in the width of both channel sections that occurred after the 1977 photo (see Figure 1-3 in Chapter 1), which occurred as a result of various changes due to the dynamic interaction of the Slough and Bay over time. As discussed, subsidence throughout the region caused the channel to deepen and fill with sediment. As the channels filled in, less and less water could move in and out, and the channel continued to shrink.

Along with these physical changes to the Slough, changes in plant composition have also occurred. In the 1970's, studies by H. T. Harvey & Associates (1984) highlighted large-scale changes in marsh plant communities throughout the South Bay. Marshes once dominated by salt marsh plants such as pickleweed (*Salicornia* spp.) and cordgrass (*Spartina* spp.) were colonized by brackish marsh plants such as alkali bulrush (*Scirpus maritimus*). In the late 1980s, efforts were made to determine the extent of these changes over time by analyzing historical aerial photographs (CH2MHill 1989). Data suggested that large-scale vegetation changes were occurring not only through shifts in marsh type, from salt to brackish marsh, but also by the formation of new marsh habitat.

For the past 15 years, the City of San Jose and other agencies have monitored Alviso Slough using vegetation mapping to determine changes in marsh plant composition and to provide baseline data for future comparisons. San Jose's mapping program began in 1989 and has since continued on a nearly-annual basis. The mapping program has been vital in detecting vegetation shifts. For example, mapping showed that 90.5 acres of new marsh formed in Alviso Slough from 1989 to 2005, which represents a 54 percent increase of new marsh area (H.T. Harvey & Associates 2005a). In this same period, 31.5 acres of salt marsh were converted to brackish marsh. Additionally, newly-formed freshwater marsh habitat was detected in Alviso Slough (beginning in the area of the Alviso Marina), which suggests that freshwater influences are playing an increasing role in structuring the marsh plant communities in the vicinity of the Alviso Marina (H.T. Harvey & Associates 2005a). These freshwater influences include changes in the amount of tidal influence reaching the Alviso Marina area, changes to the quantity and timing of freshwater inputs upstream, and the changes to the historic slough-creek connections (H.T. Harvey & Associates 2005a).

It should be noted that freshwater marsh is defined here based on the dominant vegetation, California bulrush (*Schoenplectus californicus*), which is the basis for the Figure 3.4-1 habitat map. Salinity measurements in the water column and interstitial sediment waters in the Project reach of Alviso Slough are brackish (0.5 to 15 parts per thousand). This classifies the wetland as estuarine according to the U. S. Fish and Wildlife Service. The San Francisco Estuary Institute (SFEI) mapped the Project reach of Alviso Slough as tidal marsh and labeled the channel at the Gold Street and Union Pacific Railroad bridges as a tidal freshwater channel.

Under current conditions, abundant marsh vegetation has established itself along the edges of the Alviso Slough channel, causing the width of the channel to decrease significantly. Presently, only a small channel exists (approximately 50 feet wide in 2007) and is continually shrinking due to reduced scouring caused by a lack of water flow, similar to historic conditions (PWA 2007). To permanently restore the channel width and create a sustainable waterway comparable to 1983 conditions, tidal flow in the channel must be greatly increased.

In addition to the changes in marsh plant communities, changes in wildlife populations have occurred. Historically, the South Bay contained a mosaic of habitats that supported diverse communities of animals. Utilization of Bay habitats by wildlife, particularly bird species, was high. Accurate historical bird counts are rare due to the lack of official survey data, but anecdotal accounts from hunters and naturalists support the idea of historically high waterbird abundance and diversity.

Hunters reportedly killed thousands of California clapper rails weekly, prior to 1900 (Thelander et al. 1994). Since that time, habitat loss has been the major factor in the drastic decrease in population size of the California clapper rail (USFWS 1984; Albertson and Evens 2000). In addition, salt marsh dependent species are no longer present in the upstream portions of Alviso Slough as the habitat has shifted to fresh and brackish marsh.

Existing Biological Conditions at the Alviso Slough Restoration Project Area

The distribution and type of habitats in the Project area have changed over the past decades. The habitats currently present include less open water and more vegetated marsh habitat, comprising fresher species. The following discussion presents a description of the existing conditions for vegetation and wildlife resources in the Alviso Slough Restoration Project area, including habitat descriptions, discussions of the species composition and structure of invertebrate, reptile, amphibian, mammal, and bird communities.

Vegetation

Thirteen habitat types were identified as occurring within the Alviso Slough Restoration Project area (Table 3.4-2, Figure 3.4-1). The dominant habitat types present include developed, refuge-managed pond (former salt production pond), seasonally ponded salt panne, and marsh habitats (including freshwater and brackish marshes). Salt ponds typically do not contain vegetation and consist of either hypersaline water or dried salt crust. Seasonally ponded salt panne are present in the study area in the New Chicago Marsh area, and comprise topographic depressions on mature tidal marsh plains exposed to seasonal inundation. Open water habitat includes subtidal Bay waters and tidal sloughs and channels. Mudflats occur in intertidal areas just beyond the edge of wetlands along the Bay and channels. Developed habitats consist of paved or gravel roads, levee tops with gravel slopes, unvegetated areas, and landfill habitat. These areas typically are devoid of vegetation entirely, or contain ruderal, upland species such as black mustard (*Brassica nigra*), sweet fennel (*Foeniculum vulgare*), poison hemlock (*Conium maculatum*), Italian thistle (*Carduus pycnocephalus*), or ripgut brome (*Bromus diandrus*). Upland habitat occurs along levees and roads, and contains similar ruderal species as developed habitats, although in greater density.

Table 3.4-2 Dominant Habitat Types Present within the Alviso Slough Restoration Study Area.

Habitat Type	Acreage within Study Area	Total % of Study Area
Refuge-managed Ponds	728.9	63
Seasonally Ponded Salt Panne	97.9	9
Developed	77.7	7
Brackish Marsh	74.5	6
Tidal Open Water	13.0	1
Tidal Mudflat	9.2	1
Levee	37.2	3
Diked Pickleweed	33.9	3
Freshwater Marsh	32.8	3
Upland Vegetation	27.0	2
Landfill	9.9	1
Peripheral Halophytes	4.9	<1
Unvegetated	2.1	<1
TOTAL	**1,149**	**100**

Although traditionally composed primarily of tidal marsh (see historical biological conditions, above), today Alviso Slough contains a continuum of freshwater, brackish, and salt marshes. Freshwater marsh habitats dominate the upstream, southern reaches of the Slough, which then give way to brackish and salt marsh species dominated habitats closer to Coyote Creek and the South Bay.

Freshwater tidal marsh associations are concentrated in the upstream portions of the Slough around the town of Alviso, and comprise the dominant habitat type present in the area of the proposed project footprint. Dominant freshwater plant species include California bulrush ~~(*Scirpus californica*)~~ and cattail (*Typha* spp.). Brackish tidal marsh plant associations occur throughout the Slough, with the majority of brackish marsh plant species located mid-reach between the Lower Guadalupe River and the confluence of the Slough with Coyote Creek. Brackish marsh vegetation is dominated by alkali bulrush, but also consists of perennial peppergrass (*Lepidium latifolium*), a non-native invasive species, and spearscale (*Atriplex triangularis*). Salt marsh vegetation is dominated primarily by pickleweed (*Salicornia virginica*), although alkali heath (*Frankenia salina*) and slender-leaved ice plant (*Mesembryanthemum nodiflorum*) may also occur, particularly in areas mapped as peripheral halophyte habitat. Another non-native invasive plant, *Dittrichia graveolens*, is present in large numbers in the vicinity of the Marina County Park. It is important to note, however, that the vegetation composition within all of the marshes within the Alviso Slough Restoration Project area is dynamic in nature and annual shifts in species composition have been observed. However, the overall trend in vegetation composition in the area of the Alviso Marina over the past two to three decades has been a shift toward freshwater marsh types. The National Wetland Inventory (NWI) of the USFWS categorizes the tidal marsh in this vicinity as E2EMN (Estuarine Intertidal Emergent, Regularly Flooded), and the open water habitat as E1UBL (Estuarine Subtidal Unconsolidated Bottom Subtidal (NWI 1985).

Wildlife

Despite extensive habitat loss, degradation, and the invasion of non-native benthic invertebrates, the South Bay's tidal marshes are still extremely productive. High productivity of the South Bay estuary and secondarily of alternative habitats, such as salt ponds, is largely responsible for the high abundance of many wildlife species, particularly that of waterbirds (H.T. Harvey & Associates 2005b).

Remnant tidal salt marshes provide habitat for endangered species such as the California clapper rail and are an important source of nutrients for invertebrates living in intertidal and shallow subtidal areas (Warwick and Price 1975). These nutrients sustain an abundance of invertebrates, which in turn sustain large populations of fishes, both of which are a major food source for the myriad of shorebirds, waterfowl, herons, egrets, gulls, terns, grebes, and other waterbirds that use the South Bay (H.T. Harvey & Associates 2005b). The South Bay is vital as a habitat for breeding, rearing, migrating, and wintering shorebirds.

Salt ponds, along with other alternative habitats such as artificial lakes or oxidation ponds of water treatment plants, also provide important habitat for waterbirds in the South Bay (Hanson and Kopec 1994; Harvey et. al 1992; Stralberg et. al 2003; Takekawa et. al 2000; Takekawa et. al 2001; Warnock 2004). Many species of birds including Wilson's phalarope (*Phalaropus tricolor*), red-necked phalarope (*Phalaropus lobatus*), black-necked stilt (*Himantopus mexicanus*), American avocet (*Recurvirostra americana*), western snowy plover (*Charadrius alexandrinus*), Bonaparte's gull (*Larus philadephia*), American white pelican (*Pelecanus erythrorhynchos*), and breeding gulls and terns nest and forage in the salt ponds, which provide higher-quality habitat than the existing marshes or intertidal zones (H.T. Harvey & Associates 2005). Birds commonly roost at high-tide on levees surrounding salt ponds, in shallow-water areas and bare-sediment habitat in salt ponds, and on islands and artificial structures such as boardwalks within the ponds themselves (Warnock et al,. 2002).

Alviso Ponds A8 and A12, located immediately adjacent to the Alviso Marina area, provide a range of wildlife habitat values. Observations have shown that wildlife usage in Pond A8 takes a variety of forms. Notably, a large number of shorebirds use the pond to roost and forage. Forster's terns (*Sterna forsteri*) nest within Pond A8 on small dredge-spoil islands having little or no vegetation, and black skimmers have nested on these spoil islands alongside Forster's terns in recent years (Santa Clara County Bird Data, unpublished). An increasing breeding population of California gulls (*Larus californicus*) in Pond A6 nearby threatens to encroach on these nesting terns and skimmers. An especially large concentration of nesting and roosting gulls occurs in Alviso due primarily to the abundant food resources provided by South Bay landfills, and secondarily (for a few species) to foraging opportunities provided by the high abundance of invertebrates within mid- and high- salinity ponds. Bonaparte's gull, whose abundance is highest in Pond A8, tends to forage on salt-pond-based prey.

The endangered California least tern (*Terna antillarum browni*) uses the Alviso/Mountain View area as a post-breeding staging area rather than a nesting area (Santa Clara County Bird Data, unpublished). The staging area is occupied from late June through late August, prior to the species' southward migration. Here, adult and juvenile least terns roost on levees that surround the salt ponds as well as those that lie in between ponds (S. Rottenborn, pers. obs.). They also roost on boardwalks and forage both in the salt pond and over the open waters of the Bay. Least terns have occasionally been recorded using Pond A8 for foraging and roosting, though they tend to concentrate in ponds farther west (Santa Clara County Bird Data, unpublished).

The USGS also noted high abundances of black-necked stilts and American avocets in Pond A8 (U.S. Geological Survey Unpublished Preliminary Data), and the federally threatened western snowy plover breeds in Pond A8, at least in some years (Santa Clara County Bird Data, unpublished).

Alviso Pond A12, in comparison, has previously seen limited use by wildlife due to its greater depth and higher salinity. Black-necked stilts and American Avocets occasionally breed in low numbers on the pond's levees, and large numbers of gulls, herons, and other birds roost on the levees between Pond A12 and adjacent ponds. However, recent changes in the management of this pond by the Refuge to reduce salinities as well as water depths, has resulted in much greater bird use.

~~The salt marsh harvest mouse has had a limited presence in Alviso Ponds A8 and A12, based on data from trapping surveys. Trapping data show three capture locations in the vicinity of Ponds A8 and A12: two at the eastern edge of Pond A12 in New Chicago Marsh and one on the western edge of Pond A12 (Howard Shellhammer, Unpublished Data). Due to a lack of habitat within Alviso Slough near the Marina, salt marsh dependent species are not anticipated to occur in the proposed Project area.~~

Special-Status Plant Species

The special-status plant species that occur in the South Bay in the vicinity of the Alviso Slough Restoration Project are discussed in this section. The majority of species, including all the rare and endemic plants of the Alviso Slough Restoration Project area, are associated with sub-habitats of the upper marsh (e.g., salt pan, intertidal marsh ponds, high marsh ecotonal[1] areas) or with other tidal wetland habitats. The potential for special-status plants to occur within the Alviso Slough Restoration Project area and vicinity was assessed in summer 2004, annually during the summer months, and on 20 October 2008. The assessment was based on the following factors: 1) the occurrence of species-specific hydrological requirements and microhabitat variables within the Alviso Slough Restoration Project area; 2) the occurrence of known associated species; and 3) the proximity and date of documented occurrences and published accounts of species distributions. A total of 47 special-status plant species was identified in the geographic area of this assessment. Of these 47, only 13 are known to occur in habitats similar to those found in the Alviso Slough Restoration Project area (Table 3.4-3).

---

[1] Ecotones are the transition areas between two adjacent ecological communities.

Table 3.4-3 Special-status Plant Species, Their Status, and Potential Occurrence in the Alviso Slough Restoration Project Area.

Name	Status	Habitat/ description	Potential for occurrence on site
Federal or State Rare, Threatened or Endangered Species			
Contra Costa goldfields (*Lasthenia conjugens*)	FE, CNPS 1B	Saline/alkaline vernal pools, mesic areas within grassland. Known from Alameda, Solano, Monterey, Contra Costa, and Napa counties. Annual; blooms March through June.	Two large colonies associated with grassy seasonal wetlands in the Warm Springs area and Pacific Commons Preserve in Fremont, but there is no suitable habitat present in the Alviso Slough Restoration Project area. Otherwise occurs in disjunct populations in Monterey and North Bay areas.
Mason's lilaeopsis (*Lilaeopsis masonii*)	SR, CNPS 1B	Exposed banks of tidal meanders and channels within brackish to freshwater marsh. Locally common in Suisun Marsh. Perennial; blooms April through November.	Not known to occur in the Alviso Slough Project area; historic and current records in Suisun Bay area only.
California seablite (*Suaeda californica*)	FE, CNPS 1B	Sandy, high-energy shorelines within salt marsh. Relict populations in the South Bay considered extirpated; known only from Morro Bay, San Luis Obispo county.	Extirpated from the South Bay; no suitable habitat in Alviso Slough Restoration Project area.
State Rare and CNPS Species			
Coastal marsh milk-vetch (*Astragalus pycnostachyus* var. *pycnostachyus*)	FSC, CNPS 1B	Coastal salt marshes, streamsides, and mesic coastal dunes in Marin and San Mateo counties. Perennial; blooms April to October.	Not known to occur in the South Bay area; no suitable habitat in Alviso Slough Restoration Project area (extant populations associated with maritime salt marsh).
Alkali milk-vetch (*Astragalus tener* var. *tener*)	FSC, CNPS 1B	Alkaline soils in playas, vernal pools, and adobe clay areas within grassland. Alameda, Merced, Solano, and Yolo counties. Annual; blooms March to June.	A recently rediscovered population in seasonal wetlands at the Pacific Commons Preserve in Fremont. Considered extirpated from Santa Clara County. Currently no suitable habitat in Alviso Slough Restoration Project area.

San Joaquin saltbush (*Atriplex joaquiniana*)	FSC, CNPS 1B	Alkaline soils within chenopod scrub, meadows, playas, and grasslands in 14 central California counties. Annual; blooms April through October.	Potentially occurs in seasonal wetlands in Warm Springs vicinity, and known from Pacific Commons Preserve. Currently no suitable habitat present in Alviso Slough Restoration Project area.
Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*)	CNPS 1B	Moist, alkaline soils within grassland. Tolerates disturbance. Annual; blooms June through November. Known from Alameda, Monterey, San Luis Obispo, and Santa Clara counties.	Known from several locations in Newark, Fremont, Alviso, and Sunnyvale. Slight potential. No suitable habitat present within the Project area, and only low-quality, marginal habitat is present within the study area. The species requires disturbance to establish, and so, it is unlikely that any population could establish within the Project area except ephemerally. In addition, the species has not been observed within the study area in more than two years of vegetation surveys.
Point Reyes bird's-beak (*Cordylanthus maritimus* spp. *palustris*)	FSC, CNPS 1B	Coarser substrates within salt marsh (high marsh pans, sandy barrier beaches). Known from Marin County north to Oregon. Annual; blooms June through October.	Extirpated from the South Bay area. Currently no suitable habitat present in Alviso Slough Restoration Project area.
Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*)	CNPS 1B	High marsh zone in brackish and freshwater marshes. Known from Suisun Marsh (Sacramento, San Joaquin, Solano and Contra Costa counties) and Napa marshes. Perennial; blooms May through September.	Historic and current records from North Bay area only.
Prostrate navarretia (*Navarretia prostrata*)	FSC, CNPS 1B	Seasonal wetlands and vernal pools within grassland and coastal scrub. Ranges from Monterey County south to San Diego. Annual; blooms April through July.	In the South Bay area, known only from Pacific Commons Preserve in Fremont (in the Shoreline Study area). Currently no suitable habitat present in Alviso Slough Restoration Project area.
Hairless popcorn-flower (*Plagiobothrys glaber*)	FSC, CNPS 1A	Formerly known from alkali meadows and coastal salt marshes and swamps. Extirpated throughout its range; last documented occurrence in 1954.	Presumed extinct.
Delta woolly-marbles (*Psilocarpus brevissimus* var. *multiflorus*)	CNPS 4	Dried beds of vernal pools and flats, especially in grasslands, in Alameda and Santa Clara counties north to Yolo County. Annual; blooms April to June.	Currently no suitable habitat present in Alviso Slough Restoration Project area.

Table 3.4-3 Special-status Plant Species, Their Status, and Potential Occurrence in the Alviso Slough Restoration Project Area.

Name	Status	Habitat/ description	Potential for occurrence on site
Saline clover (*Trifolium depauperatum* var. *hydrophilum*)	FSC, CNPS 1B	Edges of salt marshes, alkali meadows, and vernal pools along the coast from Sonoma County south to San Luis Obispo, as well as in the inland counties of Solano and Colusa. Annual; blooms April through June.	Historic collection (type locality) from Belmont; not recorded since in the South Bay area. Currently no suitable habitat present in Alviso Slough Restoration Project area.

CNPS 1A = Plants considered extinct
CNPS 1B = Plants rare, threatened or endangered in California and elsewhere
CNPS 4 = Plants of limited distribution watch list
FE = Federally-listed Endangered
FSC = Federal Species of Concern
SR = California Rare

Numerous occurrences of five species, including Congdon's tarplant, prostrate navarretia (*Navarretia prostrata*), alkali milk vetch (*Astragalus tener* var. *tener*), Contra Costa goldfields (*Lasthenia conjugens*), and San Joaquin spearscale (*Atriplex joaquiniana*), have been documented in the vicinity of the Alviso pond complex within the SBSP Restoration Project boundary. However, these occurrences are located exclusively within the Pacific Commons Preserve, just north of Pond A22, except for Congdon's tarplant records from Alviso (Boursier, pers. Comm.. 2007), adjacent to Stevens Creek in 2002 and at the Sunnyvale Baylands Park south of Pond A8 (CNDDB 2006).

Special-Status Wildlife Species

The legal status and likelihood of occurrence of the special-status wildlife species are given in Table 3.4-4. A number of other special-status species occur in the Project area as visitors, migrants, or foragers but are not known or expected to breed in the immediate Project area.

Animals that occasionally occur within the Project area and breed in upland habitats in the greater South Bay area, but occur only in the Alviso Slough Restoration Project area as uncommon to rare foragers, include the Bald Eagle (*Haliaeetus leucocephalus*), Golden Eagle (*Aquila chrysaetos*), Vaux's Swift (*Chaetura vauxi*), California Yellow Warbler (*Dendroica petechia brewsteri*), Bank Swallow (*Riparia riparia*), and pallid bat (*Antrozous pallidus*). Species that occur in the Project area regularly as foragers, but have "special status" only at nesting sites elsewhere in California, include the Common Loon (*Gavia immer*), American White Pelican, Cooper's Hawk (*Accipiter cooperii*), Sharp-shinned Hawk (*Accipiter striatus*), Osprey (*Pandion haliaetus*), Barrow's Goldeneye (*Bucephala islandica*), Long-billed Curlew, and Elegant Tern (*Sterna elegans*). Expanded species accounts for most of these species can be found in the Goals Project Baylands Ecosystem Species and Community Profiles (Goals Project 2000) and in the South Bay Salt Pond Restoration Project Biology and Habitats Existing Conditions report (PWA et al. 2004).

Table 3.4-4 Sensitive Animal Species, Their Status, and Potential Occurrence in the Alviso Slough Restoration Study Area.

Name	Status*	Habitat	Potential For Occurrence On Site	Seasonality
Federal or State Threatened or Endangered Species				
Bald Eagle (*Haliaeetus leucocephalus*)	FPD, SE, SP	Occurs mainly along seacoasts, rivers and lakes; nests in tall trees or in cliffs. Feeds mostly on fish.	Occasional visitor, primarily during winter, to the South Bay; does not nest in the study area or elsewhere in the South Bay. May occur as a very rare forager, most likely during fall migration.	Most likely to occur October through March. Does not breed locally.
American Peregrine Falcon (*Falco peregrinus anatum*)	SE, SP	Forages in many habitats; nests on cliffs and similar human-made structures.	Regular forager (on other birds) in the region, primarily during migration and winter. Does not breed in the study area	May occur in the study area as an occasional forager throughout the year; most common September through April.
California Clapper Rail (*Rallus longirostris obsoletus*)	FE, SE, SP	Salt and brackish marsh habitat usually dominated by pickleweed and cordgrass.	Habitat along Alviso Slough within the study area is probably not suitable for breeding (never detected breeding here). Habitat up to Gold Street is marginal for foraging.	Occasional Clapper Rails could occur in the study area at any time of year, but are least likely during breeding season, from February through June.
California Least Tern (*Sterna antillarum browni*)	FE, SE, SP	Nests along the coast on bare or sparsely vegetated flat substrates.	The South Bay is an important post-breeding staging area for Least Terns, although this species does not currently breed within the study area. Ponds A12 and A8 (within the study area) are not primary staging areas, but Least Terns could occasionally forage in these ponds.	Most likely to occur between July and September.
California Brown Pelican (*Pelecanus occidentalis californicus*)	FE, SE, SP	Occurs in nearshore marine habitats and coastal bays. Nests on islands in Mexico and southern California.	Regular but not abundant during nonbreeding season (summer and fall) in study area. Roosts on levees in the interiors of pond complexes, forages in salt ponds and Bay.	Most likely to occur between July and December.
Salt Marsh Harvest Mouse (*Reithrodontomys raviventris*)	FE, SE, SP	Salt marsh habitat dominated by pickleweed. Also found in mature brackish marshes	Marshes fringing Alviso Slough lack pickleweed and are thus not considered prime habitat. The species has recently been discovered in brackish marsh dominated by alkali bulrush ~~(*Scirpus robustus*)~~. Small possibility that it resides in similar habitat along Alviso Slough, but trapping upstream did not detect the species. Does not occur in the small isolated patch of diked pickleweed within the Pond A8. New Chicago Marsh, north and east of Alviso, supports a substantial population of salt marsh harvest mice. Unlikely to occur in the freshwater marsh areas that are likely to be impacted by the proposed Project.	Could occur in suitable habitat year-round.
California Black Rail (*Laterallus jamaicensis coturniculus*)	ST, SP	Breeds in fresh, brackish, and tidal salt marsh.	Non-breeding individuals winter in small numbers in tidal marsh within the study area, but the species is not currently known to breed in the South Bay.	Most likely to occur November through March.
Western Snowy Plover (*Charadrius alexandrinus nivosus*)	FT, CSSC	Nests in the South Bay in dry salt ponds and salt pond levees.	Breeds and forages at several sites in the South Bay. In the study area, breeds at Pond A8 and in the impoundment west of New Chicago Marsh.	Breeds April through September; non-breeding birds could occur throughout the year.

Table 3.4-4 Sensitive Animal Species, Their Status, and Potential Occurrence in the Alviso Slough Restoration Study Area.

Name	Status*	Habitat	Potential For Occurrence On Site	Seasonality
California red-legged frog *(Rana aurora draytonii)*	FT, CSSC	Freshwater ponds and still pools in streams.	Has been extirpated from the valley floor and does not occur in tidal areas. No suitable habitat in the study area.	N/A
Bank Swallow *(Riparia riparia)*	ST	Colonial nester on vertical banks or cliffs with fine-textured soils near water.	Could occur in the study area as rare transient. No suitable breeding habitat in the study area ~~and species does not breed in the Bay Area.~~ but has been known to breed within the Golden Gate National Recreation Area at Fort Funston.	Rare individuals most likely to occur during spring and fall migration.
California Species Of Special Concern				
Western Pond Turtle *(Clemmys marmorata)*	CSSC	Permanent or nearly permanent fresh or brackish water in a variety of habitats. Builds nests in upland habitat usually in hard clay soils.	Uncommon along the inshore side of pond A3W (2-3 miles due west of the Alviso Marina); scarce along lower Coyote Creek and the Guadalupe River. May occur rarely in sloughs elsewhere in the South Bay. No breeding (nesting) habitat within the Project area not expected, but could potentially nest within the study area.	Could occur in suitable habitat year-round.
American White Pelican *(Pelecanus erythrorhnchos)*	CSSC (nesting)	Forages in freshwater lakes and rivers, nests on islands in lakes.	Common non-breeder, foraging primarily on salt ponds in the study area. Regular visitor from late summer to spring. Not known to breed on site; only special-status when breeding.	Does not nest in the study area. Non-nesting individuals most common August through February.
Double-crested Cormorant *(Phalacrocorax auritus)*	CSSC (nesting)	Colonial nester on coastal cliffs, offshore islands, electrical transmission towers, and along interior lake margins. Feeds on fish.	Breeds on electrical transmission towers and on levees in the South Bay, but not known to breed within the study area. Could occur on Pond A12 as an occasional forager throughout the year; only special-status when breeding.	Year-round.
White-faced Ibis *(Plegadis chihi)*	CSSC (nesting)	Forages in freshwater marshes, and to a lesser extent, brackish areas.	Occasional visitor in fall and winter. Has not nested in the study area, and no current nesting known. Only special-status when breeding.	Non-breeding individuals most common during September and October.
Barrow's Goldeneye *(Bucephala islandica)*	CSSC (nesting)	Nests in freshwater marshes, winters in coastal marine habitats.	Occasional winter visitor; does not breed in the study area. Only special-status when breeding.	Non-breeding individuals most common during December through February.
Northern Harrier *(Circus cyaneus)*	CSSC (nesting)	Nests and forages in marshes, grasslands, and ruderal habitats.	Commonly forages over marshes and other open habitats in the study area throughout the year. Could potentially breed in New Chicago Marsh, in the northeast portion of the study area.	Year-round. Breeds March through September.
Sharp-shinned Hawk *(Accipiter striatus)*	CSSC (nesting)	Nests in woodlands, forages in many habitats in winter and migration.	Likely to occur as a migrant and winter resident. No breeding habitat in study area. Only special-status when breeding.	Non-breeding individuals most common August through March.
Cooper's Hawk *(Accipiter cooperii)*	CSSC (nesting)	Nests in woodlands, forages in many habitats in winter and migration.	Likely to occur as a migrant and winter resident. No breeding habitat in study area. Only special-status when breeding.	Non-breeding individuals most common August through March.

Table 3.4-4 Sensitive Animal Species, Their Status, and Potential Occurrence in the Alviso Slough Restoration Study Area.

Name	Status*	Habitat	Potential For Occurrence On Site	Seasonality
Osprey (*Pandion haliaetus*)	CSSC (nesting)	Nests in tall trees or cliffs on freshwater lakes and rivers and along seacoast; feeds on fish.	Could occur as an occasional forager, primarily during the nonbreeding season. No breeding records from the region. Only special-status when breeding.	Non-breeding individuals most common August through March.
Golden Eagle (*Aquila chrysaetos*)	CSSC	Breeds on cliffs or in large trees or electrical towers, forages in open areas.	Could occur as an occasional forager, primarily during the nonbreeding season. No nesting habitat present in the study area.	Non-breeding individuals most common August through March.
Merlin (*Falco columbarius*)	CSSC	Uses many habitats in winter and migration.	Regular regionally in low numbers during migration and winter. Does not nest in California. Could occur as an occasional forager.	Non-breeding individuals most common October through March.
Long-billed Curlew (*Numenius americanus*)	CSSC (nesting)	Nests on prairies and short-grass fields; forages on mudflats, marshes, pastures, and agricultural fields.	Likely to forage on mudflats and marshes, and roosts on levees, diked marshes, and ponds within the study area as a migrant and winter resident. Does not nest in the study area. Only special-status when breeding.	Non-breeding individuals most common August through March.
California Gull (*Larus californicus*)	CSSC (nesting)	Nests on lakes inland and, around S. F. Bay, in salt ponds.	Common resident in the South Bay; the colony in Pond A6 is the second largest colony in California. Forages throughout study area, but does not currently nest within the study area. Only special-status when breeding.	Occurs year-round; breeds from May through August.
Black Skimmer (*Rynchops niger*)	CSSC (nesting)	Nests on abandoned levees and islands in salt ponds and marshes.	A few pairs breed and forage in the South Bay, on islands in salt ponds. There is one record of nesting within the study area, in Pond A8. This species could nest on islands in salt ponds or on undisturbed salt pond levees in the study area. Only special-status when breeding.	Nests May through August, typically migrates out of the study area during the non-breeding season.
Short-eared Owl (*Asio flammeus*)	CSSC (nesting)	Nests on ground in tall emergent vegetation or grasses (typically in marshes), forages over a variety of open habitats.	Rare. Has bred in small numbers within the South Bay, although current breeding status unknown. Only special-status when breeding.	Non-breeders most likely to occur in migration and winter. Remote possibility of nesting in New Chicago Marsh between April and August.
Burrowing Owl (*Athene cunicularia*)	CSSC	Flat grasslands and ruderal habitats where suitable burrows (almost always ground squirrel burrows) occur.	Breeds at several upland sites around the margins of the South Bay baylands. No breeding records from within the study area, but a substantial population occurs just east of Alviso. Habitat within the study area is poor, due to lack of open grasslands, human disturbance, and lack of ground squirrel burrows. However, there is a remote possibility that this species could nest on levees or other marginal habitat in the study area, and non-breeding individuals could occur in these habitats as well.	Breeds February through August. Non-breeding individuals could occur throughout the year.
Vaux's Swift (*Chaetura vauxi*)	CSSC (nesting)	Nests in snags in coastal coniferous forests or, occasionally, in chimneys; forages aerially.	Could forage over the study area during spring migration. No nesting habitat in the study area. Only special-status when breeding.	Non-breeding individuals most likely to occur during April and May.

Table 3.4-4 Sensitive Animal Species, Their Status, and Potential Occurrence in the Alviso Slough Restoration Study Area.

Name	Status*	Habitat	Potential For Occurrence On Site	Seasonality
Loggerhead Shrike (*Lanius ludovicianus*)	CSSC (nesting)	Nests in dense shrubs and trees, forages in grasslands, marshes, and ruderal habitats.	Could potentially nest in ruderal habitat in the study areas, such as at margins developed/residential areas.	Occurs year round; nests from March through August.
California Horned Lark (*Eremophila alpestris actia*)	CSSC	Short-grass prairie, annual grasslands, coastal plains, and open fields.	Occurs in the study area during nonbreeding season. No local nesting records; not considered to be a local breeder.	Non-breeding birds most likely August through February.
California Yellow Warbler (*Dendroica petechia brewsteri*)	CSSC (nesting)	Breeds in riparian woodlands, particularly those dominated by willows and cottonwoods.	Occurs in the study area as a migrant. No nesting habitat within the study area, but nests in riparian habitat upstream from the Bay. Only special-status when breeding.	Non-breeders most likely to occur during spring (April) and fall (August) migration.
Saltmarsh Common Yellowthroat (*Geothlypis trichas sinuosa*)	CSSC	Breeds primarily in fresh and brackish marshes in tall grass, tules, willows; uses salt marshes more in winter.	Common resident in the South Bay, breeding in freshwater and brackish marshes (and possibly to a limited extent in salt marshes), and foraging in all 3 marsh types during the nonbreeding season. Nests in tules bordering Alviso Slough.	Occurs year-round, nests April through August.
Alameda Song Sparrow (*Melospiza melodia pusillula*)	CSSC	Breeds in salt marsh, primarily in marsh gumplant and cordgrass along channels.	Uncommon resident in the South Bay, breeding and foraging in tidal salt marsh. Within the study area, may breed in vegetation bordering Alviso Slough.	Occurs year-round, nests March through August.
Tricolored Blackbird (*Agelaius tricolor*)	CSSC (nesting)	Breeds near freshwater in dense emergent vegetation.	Although can breed in brackish marshes on rare occasions, habitat in the study area is marginal, and there are no local nesting records. This species is considered absent as a breeder. Non-breeders could occur throughout the study area, but have no special status. Only special-status when breeding.	Non-breeders most likely to occur during winter (November through March).
Salt Marsh Wandering Shrew (*Sorex vagrans halicoetes*)	CSSC	Medium high marsh with abundant driftwood and pickleweed.	Habitat within the study area is not typical for this species, which usually occurs in marshes directly bordering San Francisco Bay. However, this species has been recorded at New Chicago Marsh, and could occur throughout that habitat. Not likely to occur elsewhere in the study area.	Year-round.
State Fully Protected Species				
White-tailed Kite (*Elanus leucurus*)	SP (nesting)	Nests in tall shrubs and trees, forages in grasslands, marshes, and ruderal habitats.	Common resident in the South Bay. Within the study area, nesting habitat is marginal at best, due to human disturbance and lack of trees. Unlikely to nest in the study area, but there is a remote possibility that White-tailed Kites could nest in shrubs or trees away from human disturbance.	Occurs year-round; nests March through September.

Table 3.4-4 Sensitive Animal Species, Their Status, and Potential Occurrence in the Alviso Slough Restoration Study Area.

Name	Status*	Habitat	Potential For Occurrence On Site	Seasonality
Other Potentially Sensitive Wildlife Species				
Black-necked Stilt (*Himantopus mexicanus*)	None	Nests is pickleweed salt marshes and salt pan habitat. Forages in shallow water habitats.	Common resident in the South Bay. Although this species has no special status, the high density of breeding and non-breeding birds in New Chicago Marsh is a significant biotic resource.	Year round; nests April through August.
Yuma bat (*Myotis yumanensis*)	Yellow (Western Bat Working Group designation)	Riparian obligate. Forages above aquatic habitats.	A colony of Yuma bats occurs in buildings adjacent to the Project area. This species forages over the slough in the study area.	Year round; maternity season occurs primarily from April through July.
Roosting shorebirds (many species)	None	The South Bay salt ponds are used by many species of shorebirds as important foraging and roosting habitat. Particularly abundant species include the Western Sandpiper (*Calidris mauri*) and Dunlin (*Calidris alpina*). Shorebirds forage in shallow water and roost on islands and salt pond levees.	Non-breeding shorebirds are common in the South Bay salt ponds. Within the study area, Pond A8 and the impoundment east of Pond A12 provide good shallow-water roosting and foraging habitat. Although these species have no special regulatory status, The South Bay salt ponds provide important habitat for these species to build fat reserves necessary for migration to breeding areas.	Many shorebird species occur throughout the winter, but abundance peaks during spring (April-May) and fall (August-October) migration.
Marsh Wren (*Cistothorus palustris*)	None	Breeds primarily in fresh and brackish marshes in tall grasses, tules, and cattails	Common resident in the South Bay, breeding in freshwater and brackish marshes (and possibly to a limited extent in salt marshes), and foraging in all 3 marsh types during the nonbreeding season. Nests in cattails bordering Alviso Slough.	Occurs year-round, nests April through August.

FE = Federally-listed Endangered
FT = Federally-listed Threatened
FC = Federal Candidate. Sufficient biological information to support a proposal to list the species as Endangered or Threatened
FPD = Federally Proposed for Delisting
SE = State-listed Endangered
ST = State-listed Threatened
CSSC = California Species of Special Concern
SP = State Fully Protected Species
Yellow = Medium conservation concern under Western Bat Working Group

3.4.3 Environmental Impacts and Mitigation

Significance Criteria

The proposed Project would have a number of effects on the biological resources of the Project area. In accordance with CEQA Guidelines Section 15065, a significant impact on biotic resources would occur if the Project would:

- Substantially reduce the habitat of a fish or wildlife species;
- Cause a fish or wildlife population to drop below self-sustaining levels;
- Threaten to eliminate a plant or animal community; and/or
- Substantially reduce the number or restrict the range of an endangered, rare, or threatened species.

Also, in accordance with Appendix G of CEQA, a significant impact on biotic resources would occur if the Project would:

- Have a substantial adverse effect, either directly or through habitat modifications on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFG, or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFG or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Three general assumptions need to be identified to understand the thresholds of significance for impacts to the Project area's wildlife resources. These assumptions are as follows:

- Direct impacts to wildlife species are assumed to be correlated with the loss of plant communities that provide their primary habitat. These losses would result from site excavation, grading, filling or other damage to habitats, and direct wildlife loss or disturbance by construction activities and human uses. The conversion of these communities, therefore, may result in the loss of or reduction of use for some wildlife species. The existing wildlife species are usually eliminated or replaced with a suite of species that tolerate project implementation.
- Indirect impacts to wildlife could also occur. If remaining fragments of undisturbed habitat are isolated from larger areas of contiguous habitat, the remaining habitats are expected to have lower biological values than those prevailing before project implementation.
- The magnitude of Project impacts to wildlife species is determined by both the extent of suitable habitat that would be affected and by the number of individuals or breeding pairs that could be

impacted, both directly and indirectly, by Project activities. For the purpose of determining whether such an impact is "substantial", and thus significant, under CEQA, the impacts to habitat, individuals, or breeding pairs expected to result from the Project is compared to regional (e.g., South Bay-wide) abundance to determine whether the Project would have a substantial effect on the species in question.

CEQA Guidelines indicate that a substantial reduction in the habitat of a fish or wildlife species would be a significant impact. For species that use a single habitat type (e.g., only tidal freshwater marsh), determining whether the Alviso Slough Restoration Project would result in a substantial reduction in habitat is fairly straightforward. As a result, making significance determinations on the basis of habitat loss or gain has been used instead of changes in the numbers of individuals to determine thresholds of significance.

Thresholds of significance for potential Project impacts to biological resources are discussed below. The rationale for each impact includes a description of how the threshold of significance was selected, indicates how the threshold of significance is related to the restoration target and the triggers, and illustrates mitigation measures used to avoid a significant impact. Given the rarity of Pacific coastal wetland habitat and the substantial losses of this habitat that occurred prior to the implementation of the CWA, mitigation for impacts to this habitat must be considered only after avoidance measures have been thoroughly considered.

Impacts & Mitigation

The impacts analysis in this ~~Draft~~ Final EIR evaluates five action alternatives and the required No Project alternative. The action alternatives include wetland vegetation removal and/or dredging, as described in Chapter 2. Under the No Project alternative, the District would not take any action in the Project area, and existing programs would continue. The analysis covers impacts from the construction and maintenance phases– both in the slough and at staging areas.

The proposed alternatives remove wetland habitat that is regulated by Federal, State, and local laws, regulations, and policies. The following acreages of tidal brackish wetland habitat are predicted to be removed under each proposed alternative:

- Alternative 1: Vegetation and root mass removed to a 4-foot depth over 2.6 acres;
- Alternative 2: Vegetation and root mass removed to a 4-foot depth over 7.0 acres;
- Alternative 3: Vegetation and root mass removed by dredging to a depth of 8 feet over 3.7 acres;
- Alternative 4: Vegetation and root mass removed by dredging to a depth of 16 feet over 6.2 acres; or
- Alternative 5: Vegetation and root mass removed to a 4-foot depth over 15.3 acres plus removal by dredging to a depth of 10 feet over 9.7 acres for a total of 25 acres.

All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by BCDC, CSLC, the District, or SBYC by the time of commencement of construction of this Project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Table 3.4-5 lists each impact identified for the proposed alternatives, along with the significance of each impact. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (less than significant and does not require mitigation), or Class IV (beneficial). Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections.

Table 3.4-5 Impact and Mitigation Summary – Terrestrial Biology

Impact	Impact Significance	Mitigation Measures
Impact TERRBIO-1: Potential construction-related loss of, or disturbance to, special-status, marsh-associated wildlife.	Alts. 1-5: Class II	TERRBIO-A TERRBIO-B
	Alt. 6: No Impact	--
Impact TERRBIO-2: Potential disturbance to, or loss of, sensitive wildlife species due to maintenance activities.	Alts. 1-5: Class II	TERRBIO-A
	Alt. 6: No Impact	--
Impact TERRBIO-3: Potential construction-related loss of, or disturbance to pond-nesting recurvirostrids (American avocet, black-necked stilt).	Alts. 1-5: Class III	
	Alt. 6: No Impact	
Impact TERRBIO-4: Potential construction-related loss of, or disturbance to pond-nesting Western snowy plovers.	Alts. 1-5: Class II	TERRBIO-C
	Alt. 6: No Impact	--
Impact TERRBIO-5: Potential impacts to piscivorous birds.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact TERRBIO-6: Potential impacts to foraging habitat for diving and dabbling ducks.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact TERRBIO-7: Potential impacts to special-status plant species.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact TERRBIO-8: Potential colonization by non-native perennial pepperweed (*Lepidium latifolium*).	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact TERRBIO-9: Impacts to tidal marsh habitat through removal of vegetation and dredging.	Alts. 1-5: Class II	TERRBIO-B
	Alt. 6: No Impact	--
Impact TERRBIO-10: Impacts to jurisdictional wetlands.	Alts. 1-5: Class II	TERRBIO-B
	Alt. 6: No Impact	--
Impact TERRBIO-11: Impacts related to Mitigation Measure TERRBIO-B, wetland creation.	Alts. 1-5: Class III	
	Alt. 6: No Impact	
Impact TERRBIO-12: Impacts related to the Mitigation Measures HYD-A and HYD-E, impacts to wetlands from hydrological mitigation measures.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--

Table 3.4-5 Impact and Mitigation Summary – Terrestrial Biology

Impact	Impact Significance	Mitigation Measures
Impact TERRBIO-13: Impacts related to stockpiling of materials.	Alts. 1-5: Class II	TERRBIO-A TERRBIO-C TERRBIO-D
	Alt. 6: No Impact	--
Impact TERRBIO-14: Impacts related to increased boat use.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact TERRBIO-15: Impacts to bird reproduction as a result of increased mercury methylation and bioaccumulation.	Alts. 1-5: Class I~~II~~	WQ-C TERRBIO-B
	Alt. 6: No Impact	--
Note: The impacts and mitigation would be the same both with and without the SBSP Restoration Project.		

Impact TERRBIO-1: **Potential construction-related loss of, or disturbance to, special-status, marsh-associated wildlife.**

Summary - Common to all Alternatives

Construction related to the implementation of the Alviso Slough Restoration Project could potentially disturb some special-status wildlife species, and in some cases, could lead to the loss of individuals. Special-status species that occur in tidal marsh habitats in the study area include the salt marsh harvest mouse (*Reithrodontomys raviventris*), salt marsh wandering shrew (*Sorex vagrans halicoetes*), California clapper rail, California black rail (*Laterallus jamaicensis coturniculus*), salt marsh common yellowthroat (*Geothlypis trichas sinuosa*), Alameda song sparrow (*Melospiza melodia pusillula*), and northern harrier (*Circus cyaneus*). Although present within the vicinity, the salt marsh harvest mouse, salt marsh wandering shrew, or California clapper rail are not expected to occur in the Project impact footprint which is dominated by freshwater vegetation (e.g., California bulrush and cattail). Two occurrences of California clapper rail have been recorded in the vicinity of the Gold Street Bridge during the non-breeding season. However, these were very rare events and this area is not expected to be regularly visited by California clapper rails. Salt marsh common yellowthroats and Alameda song sparrows may breed in the Project impact footprint; northern harriers may use the area for foraging.

Construction activities associated with the Project (e.g., vegetation and root mass removal, sediment dredging) would involve removing 2.6 to 25 acres of wetland habitat, movement of heavy equipment, loud noise, and human presence in, and adjacent to existing tidal marsh habitats. These activities may result in the disturbance of wildlife within those habitats, possibly causing adverse effects. These effects include loss of breeding habitat, individuals fleeing areas adjacent to construction activities, and/or the abandonment of nests or territories. It should be noted, however, that freshwater marsh species such as the salt marsh common yellowthroat and the Alameda song sparrow were not adversely affected in the long term by dredging activity in the Alameda Flood Control Channel. These species actually showed a higher density in sections of the channel after the vegetation was allowed to recover post-dredging (H T. Harvey & Associates, unpublished data). However, continued vegetation removal would result in a permanent reduction in habitat for these species.

The Alviso Slough Restoration Project incorporates measures to avoid and minimize construction-related impacts to tidal marsh species; it is anticipated that a number of measures to avoid and minimize such impacts to federally listed, state listed, and state fully protected species would be required by the Biological Opinion for this Project. For example, work in areas that could cause disturbance, injury, or mortality (e.g., accidental crushing of individuals or nests) would be limited to the period September 1 through February 28, to the extent practicable. Table 3.4-6 presents the likely work windows that would be used to avoid disturbance impacts for sensitive wildlife and fish species. Additional specific details for work windows would be identified and implemented in consultation with NMFS, USFWS, and CDFG.

Table 3.4-6 Likely Work Windows for Sensitive Wildlife Species (TERRBIO) and for Sensitive Fish Species (AQBIO)†

Wildlife	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
TERRBIO-1 Construction-related loss of, or disturbance to, special-status species, marsh-associated wildlife (Also relevant for TERRBIO-2, TERRBIO-4 and TERRBIO-13)												
Migratory Bird Breeding Season	■	■	▨	▨	▨	▨	▨	▨	▨■	■	■	■
Raptor/Owl & Clapper Rail Breeding Season	■▨	▨	▨	▨	▨	▨	▨	▨	■	■	■	■
AQBIO-4 Construction-related habitat disturbance (Also relevant for AQBIO-5 and AQBIO-7)												
Steelhead and Chinook Salmon	▨	▨	▨	▨	▨	■	■	■	■	■	■	▨
Longfin Smelt††	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨

† This table illustrates likely in-water work windows for sensitive fish species based on permit conditions for the SBSP Pond A8 project (provided for steelhead). Actual in-water work windows for the proposed project are subject to change and shall be developed in consultation with NMFS, USFWS, and CDFG.

†† Spawning generally occurs between November and June; however, fish could be present all year.

▨ Consultation required	■ General Work Window

If seasonal avoidance is not practicable, vegetation would need to be mowed to remove the nesting substrate outside of the breeding season in advance of any root mass removal of dredging. Pre-construction surveys would also be conducted for salt marsh common yellowthroat and Alameda song sparrow in adjacent marshes to determine if there is potential for the species to occur in the vicinity of the disturbance. If special-status species are located within the Project area, consultation with the USFWS and CDFG would also be required.

The Project would directly impact water quality through vegetation removal and sediment dredging, which would temporarily increase turbidity, and sediment stabilization in the slough. The Project would also directly impact habitat used by local and regional wildlife. Additionally, all alternatives include the removal of navigational hazards from the Project area and modifications to the Pond A8 overflow weir.

While these activities may also result in short-term construction disturbance to wildlife species, the removal of the abandoned vessels in the area would be a benefit to the Slough.

Alternative 1: Vegetation and Root Mass Removal (2.6 acres)

The removal of wetland vegetation and root material to a depth of 4 feet along approximately 1,400 feet (30- to 100-foot wide area) of Alviso Slough would occur in an area of approximately 2.6 acres, of which 1.5 acres are identified as freshwater marsh. This loss of marsh habitat represents approximately 5 percent of the freshwater marsh habitat in the study area. The remaining area comprises the existing docks and abandoned boats.

Proposed activities would result in the potential loss of, or disturbance to, special-status wildlife species. This alternative would require 3 maintenance cycles over 10 years, resulting in further disturbance to wildlife species. The resultant average width of open water would be 80 feet. Because of the high quality of tidal marsh habitat and predicted high use by wildlife species in this area, a mitigation ratio of 2:1 (mitigation: impact) would reduce impacts related to vegetation removal. However, reduced wildlife use is predicted in the wetland habitat, since this alternative is located in the immediate vicinity of the SBYC and nearby the Blue Whale Sailing School. These developed areas have existing docks, boats, and continued human disturbance that reduce wildlife use.

Alternative 1 impacts to wetland habitat as habitat for special-status wildlife would result in the potential construction-related loss of, or disturbance to, special-status, marsh-associated wildlife (see Table 3.4-4 for the list of special-status wildlife species that are associated with the marsh habitat). This impact is considered to be **Less than Significant with Mitigation.** The following mitigation measures would be implemented:

- **Mitigation Measure TERRBIO-A: Construction timing to avoid breeding seasons.** Construction-related activities shall be restricted to the non-breeding season for special-status, marsh-related wildlife species. This shall limit activities to the period September 1 through February 28. If seasonal avoidance is not practicable, pre-construction surveys would be conducted to determine if there is a potential for special-status species to occur in the vicinity of the disturbance. If an inactive nest is located in these areas, it would be removed before the start of the breeding season (approximately February 1) if possible. The District shall also remove all vegetation from the construction zones during the nonbreeding season to minimize effects on nesting birds.

  If construction occurs during the breeding season and all affected vegetation has not been removed, a qualified biologist shall survey the construction area for active nests and young migratory birds immediately before construction. If special-status species are located, communication with the USFWS and CDFG shall be implemented to determine the appropriate response. These actions may include avoidance measures such as establishing construction setbacks from detected nests, delay in construction until nesting is complete, or slight modifications to the Project impact footprint.

In addition, implementation of TERRBIO-B would result in increases in tidal marsh habitat, a beneficial effect for tidal marsh-associated wildlife. This increase in habitat would offset any minor short-term construction-related and loss of habitat impacts to these species. Finally, the District has detailed internal guidance documents for their stream and levee maintenance work. All BMPs under the SMP would be applied to this Project. For example, specific BMPs would include:

- 1.1 – Conduct Work During Low Flow Periods
- 1.5 – Erosion and Sediment Control Measures
- 1.8 – Handle Sediments So As to Minimize Water Quality Impacts
- 1.9 – Soil Stockpiles
- 2.1 – Minimize Vegetation Removal
- 3.1 – Minimize Impacts to Special-status Plants and Animals
- 3.2 – Minimize Impacts to Nesting Birds
- 3.10 – Conduct In-Channel Work During the Dry Season
- 4.5 –Vehicle and Equipment Cleaning
- 4.8 – Implement Public Safety Measures
- 6.1 – Spill Prevention
- 6.4 – Vehicle and Equipment Fueling

- **Mitigation Measure TERRBIO-B: 2:1 replacement of tidal wetland habitat.** The restoration of historic tidal marsh habitat within the South Bay at a ratio of 2:1 (e.g., 5.2 acres restored for impacts to 2.6 acres of tidal marsh habitat) would be implemented to offset the impacts to wetlands from the Project. A 2:1 mitigation ratio is appropriate based on the quality of the habitat that is being impacted and the temporal loss of habitat functions, and values while the mitigation wetlands are developing.

  Numerous feasible mitigation avenues to create 5.2 acres (or greater) of tidal wetland habitat are present in the vicinity, such as at Pond A4. Other mitigation options include contributing to ongoing tidal marsh restoration Projects, such as Pond A6, that are part of the overall SBSP Restoration Project. Additional phases of the SBSP Restoration Project envision restoring tidal marsh in extensive areas of former salt ponds. Mitigation for this Project could occur at one of the future tidal restoration sites, as any tidal wetland restoration within the upper reaches of the Refuge would serve as appropriate in-kind mitigation. Mitigation could take the form of paying an in lieu fee to the restoration program, or implementing a discrete restoration action within the Alviso pond complex. For example, the District funded the restoration of Ponds A19, A20, and A21 as mitigation for their SMP and the LGRP. These types of agreements would require approval from the USFWS as well as other regulatory agencies.

  If the District undertakes a discrete wetland mitigation project separate from the SBSP program, a Mitigation and Monitoring Plan (MMP, separate from the MMRP in Chapter 5 of this EIR) shall be prepared outlining the details of the proposed wetland mitigation, and submitted to the regulatory agencies as part of the project's permit application. Mitigation habitat must be tidal wetland habitat (freshwater, brackish, or salt marsh) within the Alviso pond complex of former salt-production ponds, designed to maximize species diversity, to provide high productivity marsh habitat, and to establish habitat values that are similar or greater to that which is being removed.

A monitoring plan shall be developed for any mitigation site planned for this Project to ensure success of the created tidal marsh habitat. The mitigation site shall be deemed successful when the site has achieved a target percent cover by native wetland vegetation (such as the 70 percent cover being targeted by the SBSP Restoration Project within 5 years of reaching the appropriate colonization elevation) with active invasive species control (i.e., treatment of any invasive species that colonizes the site) for at least the first five years. As part of an overall mitigation package, other marsh enhancement opportunities in the Project vicinity would be considered, such as increasing resources in the existing programs for removal of non-native invasive species (e.g., saltmarsh cordgrass (*Spartina alterniflora*) and its hybrids, giant reed (*Arundo donax*)) or the creation or enhancement of high marsh-upland transition areas.

Alternative 2: Vegetation and Root Mass Removal (7.0 acres)

The removal of wetland vegetation to a depth of 4 feet along approximately 3,400 feet (40- to 200-foot wide area) of Alviso Slough would occur in an area of approximately 7.0 acres, of which 5.1 acres is identified as freshwater marsh and 0.2 acres as brackish marsh. This loss of marsh habitat represents approximately 16 percent of freshwater marsh and <1 percent of brackish marsh habitat in the study area.

Proposed activities would result in the potential loss of or disturbance to, special status wildlife species. This alternative would require regular maintenance in 3 intervals over the initial 10 year project timeline. The resultant average width of open water is expected to be 130 feet. Because of the high quality of tidal marsh habitat and predicted high use by wildlife species in this area, a mitigation ratio of 2:1 (mitigation: impact) would reduce impacts related to vegetation removal.

Alternative 2 impacts to wetland habitat would result in the potential construction-related loss of, or disturbance to, special-status, marsh-associated wildlife (see Table 3.4-4 for the list of special status wildlife species that are associated with the marsh habitat). This impact is considered to be **Less than Significant with Mitigation**. The following mitigations would be implemented:

- **Mitigation Measure TERRBIO-A, Construction timing to avoid breeding seasons,** applies here.
- **Mitigation Measure TERRBIO-B, 2:1 replacement of tidal wetland habitat** (for 7.0 acres), applies here.

Alternative 3: Vegetation and Root Mass Removal (3.7 acres) with dredge to 8-foot depth

The removal of wetland vegetation along approximately 2,300 feet (20- to 150-foot wide area) of Alviso Slough would occur in an area of approximately 3.7 acres, of which 2.0 acres is identified as freshwater marsh and 0.5 acres as brackish marsh. This loss of marsh habitat represents approximately six percent of freshwater marsh and one percent of brackish marsh habitat in the study area.

Proposed activities would result in the potential loss of, or disturbance to, special-status wildlife species. The resultant average width of open water would be 100 feet. Because of the high quality of tidal marsh habitat and predicted high use by wildlife species in this area, a mitigation ratio of 2:1 (mitigation: impact) would reduce impacts related to vegetation removal. However, minimal special status wildlife use is predicted in the wetland habitat since this alternative is located at the SBYC, Blue Whale Sailing

School, and close to the eastern levee trail. These developed areas have existing docks, boats, trails, and continued human disturbance that reduce wildlife use, particularly special status wildlife.

In addition, dredging this area to a depth of 8 feet would result in the generation of approximately 48,000 c.y. of material. This sediment would be removed ~~via Aquamog (requiring a fallback "fill" permit from the USACE),~~ dewatered in an upland pen, and tested using the ITM (Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S.—Inland Testing Manual) and standards developed by the RWQCB. If possible, dredge material would be used as fill for mitigation procedures.

Alternative 3 impacts to wetland habitat would result in the potential construction-related loss of, or disturbance to, special-status, marsh-associated wildlife (see Table 3.4-4 for the list of special status wildlife species that are associated with the marsh habitat). This impact is considered to be **Less than Significant with Mitigation**. The following mitigations would be implemented:

- **Mitigation Measure TERRBIO-A, Construction timing to avoid breeding seasons,** applies here.
- **Mitigation Measure TERRBIO-B, 2:1 replacement of tidal wetland habitat** (for 3.7 acres), applies here.

Alternative 4: Vegetation and Root Mass Removal (6.2 acres) and dredge to 16-foot depth

The removal of wetland vegetation along approximately 2,200 feet (100- to 200- foot wide area) of Alviso Slough would occur in an area of approximately 6.2 acres, of which 2.9 acres is identified as freshwater marsh and 1.1 acres as brackish marsh. This loss of marsh habitat represents approximately nine percent of freshwater marsh and two percent of brackish marsh habitat in the study area.

Proposed activities would result in the potential loss of, or disturbance to, special-status wildlife species. The resultant average width of open water would be 110 feet. Because of the high quality of tidal marsh habitat and predicted high use by wildlife species in this area, a mitigation ratio of 2:1 (mitigation: impact) would reduce impacts related to vegetation removal. However, minimal special status wildlife use is predicted across approximately half of the impact area since part of this alternative is located at the SBYC and nearby the Blue Whale Sailing School. These developed areas have existing docks, boats, and continued human disturbance that limits wildlife use, particularly special-status wildlife. Similarly, the western half of the proposed impact area is on the opposite side of the slough, in an area with active boat traffic near the docks. Boat traffic has been shown to impact wildlife use and it probably can be assumed that commercial, and recreational boats reduce wildlife use, especially special-status wildlife use at these locations.

In addition, dredging this area to a depth of 16 feet would result in the generation of approximately 160,000 c.y. of wet sediment. This sediment would be removed ~~via Aquamog~~, dewatered in an upland pen, and tested (if it would be used in sensitive locations) using the ITM (Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S.—Inland Testing Manual) and standards developed by the RWQCB. If possible, dredge material would be beneficially re-used for habitat creation.

Alternative 4 impacts to wetland habitat would result in the potential construction-related loss of, or disturbance to, special-status, marsh-associated wildlife (see Table 3.4-4 for the list of special status wildlife species that are associated with the marsh habitat). This impact is considered to be **Less than Significant with Mitigation**. The following mitigation measures would be implemented:

- **Mitigation Measure TERRBIO-A, Construction timing to avoid non-breeding seasons,** applies here.
- **Mitigation Measure TERRBIO-B, 2:1 replacement of tidal wetland habitat** (for 6.2 acres), applies here.

Alternative 5: Vegetation and Root Mass Removal (15.3 acres) to 4-foot depth and dredging of additional area (9.7 acres) to 10-foot depth

The removal of wetland vegetation along approximately 3,300 feet (100- to 850-foot wide area) of Alviso Slough would occur in an area of approximately 25 acres, of which 13.9 acres is identified as freshwater marsh and 5.0 acres as brackish marsh. The remaining area comprises the existing docks, abandoned boats, non-native weeping willow trees, and associated upland habitat. This loss of marsh habitat represents approximately 42 percent of freshwater marsh and 7 percent of brackish marsh habitat in the study area. Although the loss of approximately 19 acres of marsh represents a large proportion of the study area, freshwater and brackish marsh habitats are abundant in the South Bay area. Total area of freshwater and brackish marsh in the South Bay is approximately 135 acres and 633 acres respectively (H. T. Harvey & Associates, 2007). The loss of marsh habitat from Alternative 5 represents approximately 10 percent of total freshwater habitats in the South Bay and approximately 1 percent of total brackish habitats. Freshwater marshes dominated by cattails and tules are not a particularly unique habitat in this setting, and the loss of this amount of freshwater marsh is not considered significant.

Proposed activities would result in the potential loss of or disturbance to, special status wildlife species. The resultant average width of open water would be 160 feet, increasing habitat for wildlife species that use open water, and exposed mudflat habitat. Because of the high quality of tidal marsh habitat and predicted high use by wildlife species in this area, a mitigation ratio of 2:1 (mitigation: impact) would reduce impacts related to vegetation removal.

In addition, dredging this area to a depth of 10 feet would result in the generation of approximately 156,000 c.y. of material. This sediment would be removed ~~via Aquamog~~, dewatered in an upland pen, and tested (if it would be used in sensitive locations) using the ITM (Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S.—Inland Testing Manual) and standards developed by the RWQCB. If possible, dredge material would be used as fill for mitigation procedures.

Alternative 5 impacts to wetland habitat would result in the potential construction-related loss of, or disturbance to, special-status, marsh-associated wildlife (see Table 3.4-4 for the list of special status wildlife species that are associated with the marsh habitat). This impact is considered to be **Less than Significant with Mitigation**. The following mitigation measures would be implemented:

- **Mitigation Measure TERRBIO-A, Construction timing to avoid breeding seasons,** applies here.
- **Mitigation Measure TERRBIO-B, 2:1 replacement of tidal wetland habitat** (for 25 acres), applies here.

Alternative 6: No Project

Under the No Action Alternative, no construction-related impacts would occur. No mitigation would be required for this alternative as there is **No Impact** under this alternative.

Impact TERRBIO-2: **Potential disturbance to, or loss of, sensitive wildlife species due to maintenance activities.**

Alternatives 1, 2, 3, 4, and 5

Following dredging and vegetation removal, similar on-going maintenance activities would be necessary to maintain the slough's target depths, and widths. These repeated maintenance activities have the potential to cause disturbance to breeding species, with the possibility of site, nest, or colony abandonment, and may inadvertently contribute to lower population numbers. The frequency at which these actions would be repeated would vary by alternative. Examples of activities include:

- Controlling vegetation via mechanical harvesting; and
- Dredging of sediment via mechanical dredging techniques (Alternatives 3, 4, and 5 only).

Maintenance required by the Alviso Slough Restoration Project could potentially disturb some special-status wildlife species, and in some cases, could lead to the loss of individuals. Special-status species that occur in tidal marsh habitats in the study area include the salt marsh harvest mouse, salt marsh wandering shrew, California clapper rail, salt marsh common yellowthroat, Alameda song sparrow, and northern harrier. Salt marsh common yellowthroats and Alameda song sparrows may breed in the Project impact footprint; northern harriers may use the area for foraging. Salt marsh harvest mice and salt marsh wandering shrews are endemic to the salt and brackish marshes of the San Francisco Bay Estuary and are generally associated with habitats dominated by pickleweed and saltgrass. Clapper rails are typically found in the intertidal zone and sloughs of salt and brackish marshes dominated by pickleweed, Pacific cordgrass, gumplant (*Grindelia stricta* var. *angustifolia*), saltgrass, jaumea (*Jaumea carnosa*), and adjacent upland refugia.

Vegetation and root mass removal, as well as sediment dredging (Alternatives 3, 4, and 5) would involve the movement of heavy equipment, loud noise, and human presence in and adjacent to existing tidal marsh habitats. These activities may result in the disturbance of wildlife within those habitats, possibly causing short-term adverse effects. These effects include individuals fleeing areas adjacent to maintenance activities and/or the abandonment of nests or territories.

It is anticipated that a number of measures to avoid and minimize such impacts to federally listed species would be required by the Biological Opinion for this Project. For example, work in areas that could cause disturbance, injury, or mortality (e.g., accidental crushing of individuals or nests) would be limited to the period of September 1 through January 31 to the extent practicable. If seasonal avoidance is not practicable, pre-maintenance surveys would be conducted for California clapper rail, salt marsh common yellowthroat, and Alameda Song Sparrow to determine if there is potential for the species to occur in the vicinity of the disturbance. If special-status species are located, consultation with the USFWS and CDFG would be implemented to determine the appropriate response. Finally, the District has detailed internal guidance documents for their stream and levee maintenance work. All BMPs pertaining to work in channels would be applied to this Project.

Since the habitat loss of the initial action would be considered permanent, TERRBIO-B as described above in TERRBIO-1 would mitigate for the loss of habitat, and wetland mitigation would not be required for subsequent maintenance activities over the life of the Project.

Repeated removal of wetland vegetation and root mass, and possibly dredging (Alternatives 3, 4, and 5 only), would be required approximately every 3 to 5 years. This maintenance may result in the potential loss of, or disturbance to, special-status wildlife species. It should be noted that the wetland vegetation removed by maintenance activities as part of the LGRP reestablishes itself the next growing season. But, continued removal of vegetation at this tidal marsh habitat means it is maintained in an immature and short-stature state than on Alviso Slough. Wildlife displaced from the Alviso Slough wetlands would not likely be able to re-establish in the lower Guadalupe River where periodic vegetation management is practiced. However, the length of time between dredging or vegetation removal events may allow for the development of functional habitat in the interim, as shown along the Alameda Flood Control Channel (H. T. Harvey & Associates, unpublished data). The methods proposed for vegetation removal in this Project include sediment and root mass removal, thereby resulting in a longer period before the vegetation would re-colonize the Project area.

Impacts to wetland habitat would result in the potential maintenance-related loss of, or disturbance to, special-status, marsh-associated wildlife. This impact is considered to be **Less than Significant with Mitigation**. The following mitigation measures would be implemented:

- **Mitigation Measure TERRBIO-A, Construction timing to avoid breeding seasons,** applies here.

Alternative 6: No Project

Under the No Action Alternative, no construction-related impacts would occur. No mitigation is required for this alternative as there is **No Impact** under this alternative.

Impact TERRBIO-3: **Potential construction-related loss of, or disturbance to pond-nesting recurvirostrids[1] (e.g., American avocet, black-necked stilt).**

Summary - Common to all Alternatives

In addition to wildlife species that occur in Alviso Slough habitats, nesting American avocets (*Recurvirostra americana)* and black-necked stilts (*Himantopus mexicanus*) in nearby managed pond habitats (Pond A8) and non-tidal marsh habitats (New Chicago Marsh) may be adversely affected by construction activities. Both avocets and stilts have breeding colonies in the South Bay region. Avocet nest scrapes are generally located on soft substrates of alkali flats, levees, or islands that are sparse in vegetation (Robinson et al. 1997). Stilts nest in similar habitats; however, nest sites are often associated with denser wetland vegetation (Robinson et al. 1999). In the South Bay, the majority of avocet nests are located around salt ponds, whereas stilts tend to nest in marshes (Rintoul et al. 2003). The largest South Bay avocet and stilt breeding colonies are in Pond A8 and New Chicago Marsh, respectively (Ackerman et al. 2007). Avocets and stilts forage for invertebrates, such as brine shrimp (*Artemia salina*), by wading in shallow water habitats (Hamilton 1975, Robinson et al. 1997, Robinson et al. 1999). Avocets would also feed by scything through soft substrates, such as exposed mudflats, for prey such as polychaete or oligochaete worms (Quammen 1982).

---

[1] Recurvirostrids are birds belonging to the family Recurvirostridae (avocets and stilts).

Although present within the vicinity, the American avocets and black-necked stilts are not expected to occur in the Project impact footprint which is dominated by freshwater vegetation (e.g., California and alkali bulrush, and cattail). Construction activities would involve the movement of heavy equipment, loud noise, and human presence adjacent to existing nesting habitat. These activities may result in the disturbance of birds nesting within ponds, potentially resulting in the abandonment of nests, eggs, or young, or facilitating predation on eggs or young by causing adults to flee. However, it is expected that construction activities would be restricted to the eastern levees of Pond A8 and that no Alviso Slough Restoration Project activities would occur on the pond-side of the Pond A8 levee.

Alternatives 1, 2, 3, 4, and 5

The removal of approximately 2.6 to 25 acres of vegetation from Alviso Slough may result in the potential disturbance to American avocets and black-necked stilts nesting in Pond A8. This Project would require maintenance approximately every 3 to 5 years, depending on Alternative, possibly causing further disturbance to nesting avocets and stilts.

Construction and maintenance activities are expected to result in minimal disturbance to nesting American avocets and black-necked stilts. This impact is considered to be **Less than Significant**. No mitigation measures would be required.

Alternative 6: No Project

Under the No Action Alternative, no construction-related impacts would occur. No mitigation is required for this alternative as there is **No Impact** under this alternative.

Impact TERRBIO-4: Potential construction-related loss of, or disturbance to pond-nesting Western snowy plovers.

Summary - Common Alternatives 1 through 5

In addition to wildlife species that occur in Alviso Slough habitats, nesting western snowy plovers (*Charadrius alexandrinus nivosus*) in nearby managed pond habitats (Pond A8) may be adversely affected by construction activities. Snowy plover counts in Pond A8, conducted weekly during the 2007 breeding season (March – August), averaged 12.77 adults per survey (Robinson et al. 2007). Additionally, two plover nests were located and monitored in Pond A8 in 2007 (Robinson et al. 2007).

The western snowy plover is a small pale shorebird that nests on beaches and salt pans in western North America. The USFWS listed the coastal population of the western snowy plover as a threatened species in 1993 (58 FR 12864) because of a decline in the breeding population, loss of breeding habitat, and increased depredation by non-native predators. Western snowy plovers nest on barren to sparsely vegetated beaches, salt flats, dredge spoils, levees, river bars, and salt ponds (Page et al. 1995). The breeding season of the western snowy plover in California, from nest initiation to fledging of chicks, is considered to be March 1 to September 31. Within the San Francisco Bay Area, snowy plovers are known to forage on brine flies and brine shrimp (Feeney and Maffei 1991, H. T. Harvey & Associates 1996). In the San Francisco Bay Area, shallow open water adjacent to nesting habitat, such as on active salt ponds, including historic channels and excavated "borrow ditches," provide foraging areas for western snowy plover. Degradation and use of habitat for human activities has been largely responsible for the decline in the size of the breeding population (Page et al. 1995).

Construction activities would involve the movement of heavy equipment, loud noise, and human presence adjacent to existing nesting habitat. These activities may result in the disturbance of birds nesting within ponds, potentially resulting in the abandonment of nests, eggs, or young, or facilitating predation on eggs or young by causing adults to flee. However, it is expected that most construction activities would be restricted to the eastern levees of Pond A8 and that no Alviso Slough Restoration Project activities would occur on the western, or pond-side, of the Pond A8 levee.

The removal of approximately 2.6 to 25 acres of vegetation from Alviso Slough may result in the potential disturbance to western snowy plovers nesting in Pond A8. These alternatives would require maintenance approximately every 3 to 5 years, depending on Alternative, possibly causing further disturbance to nesting plovers.

Construction and maintenance activities may result in minimal disturbance to nesting western snowy plovers. Due to the population status of the federally listed western snowy plovers, this impact is considered to be **Less Than Significant with Mitigation.** The following mitigation measures would be implemented:

- **Mitigation Measure TERRBIO-C: Avoid western snowy plover breeding season.** Construction-related activities shall be restricted to the non-breeding season for western snowy plovers. This would limit activities to the period roughly corresponding to 15 September through 1 April. If seasonal avoidance is not practicable, pre-construction surveys shall be conducted to determine if there is a potential for Western Snowy Plovers to occur in the vicinity of the disturbance. If western snowy plovers are located, consultation with the USFWS and CDFG shall be initiated to determine the appropriate response. These actions may include avoidance measures such as establishing construction setbacks from detected nests, delay in construction until nesting is complete, or slight modifications to the Project impact footprint.

All BMPs pertaining to work in channels would be applied to this Project.

Alternative 6: No Project

- Under the No Action Alternative, no construction-related impacts would occur. No mitigation is required for this alternative as there is **No Impact** under this alternative.

Impact TERRBIO-5: Potential impacts to piscivorous[1] birds.

Summary - Common Alternatives 1 through 5

Several species of piscivorous (i.e., fish-eating) waterbirds occur in the South Bay, including the pied-billed grebe (*Podilymbus podiceps*), western grebe (*Aechmophorus occidentalis*), Clark's grebe (*Aechmophorus clarkii*), double-crested cormorants (*Phalacrocorax auritus*), American white pelican, brown pelican (*Pelecanus occidentalis*), large waders (i.e., herons and egrets), Forster's tern (*Sterna forsteri*), Caspian tern (*Sterna caspia*), and several gull species (*Laridae*). Several of these species, including green herons (*Butorides virescens*), great egrets (*Ardea alba*), snowy egrets (*Egretta thula*), and black-crowned night-herons (*Nycticorax nycticorax*), nest in marshes in the Project area. Great blue herons nest on artificial structures (electrical towers, and in Eden Landing on an old building) and pied-billed grebes nest in non-tidal ponds in the South Bay. The other piscivorous species addressed in this section occur in the Alviso Slough Restoration Project area as non-breeders.

---

[1] Piscivorous means fish-eating.

The piscivorous birds of the South Bay forage in a variety of habitats and locations where prey fish are available. Tidal sloughs and channels, low-salinity salt ponds that support fish, edges of intertidal mudflats, non-tidal ponds and channels, and artificial lakes such as Shoreline Lake, provide the highest-quality foraging areas, and large "frenzies" of feeding activity may be observed at these locations, presumably when conditions result in large fish concentrations. Brown pelicans usually plunge-dive for fish and therefore require water several feet deep, but American white pelicans, and cormorants swim while feeding, and can thus feed in shallower water. Although double-crested cormorants, western and Clark's grebes, and brown pelicans forage to varying degrees within the open waters of the Bay, American white pelicans do not, instead preferring non-tidal waterbodies (Cogswell 2000; Harvey 1988; Harvey et al. 1988). Species richness of large waders, such as herons and egrets, tended to be higher in the tidal salt marsh than in salt ponds, although piscivore abundance was higher in salt ponds (Stralberg et al. 2003). Herons and egrets forage primarily in sloughs and marshes, with only some birds moving to salt ponds at high tide (Anderson 1970; Swarth et al. 1982).

Construction and maintenance activities associated with the Alviso Slough Restoration Project (e.g., vegetation and root mass removal, sediment dredging) may negatively affect large waders, such as egrets and herons, by removing marsh habitat used for foraging. The increased turbidity associated with vegetation removal and/or sediment dredging may temporarily decrease the prey items available to piscivores, and may also decrease foraging success by reducing visibility in the water column. Construction and maintenance activities would involve the movement of heavy equipment, loud noise, and human presence in and adjacent to existing marsh habitats. These activities may result in the disturbance of piscivorous birds within those habitats, possibly causing short-term adverse effects. These effects include individuals fleeing areas adjacent to construction activities.

Impacts to wetland habitat and slough water quality may result in the temporary loss of foraging habitat for wading piscivores, and the possible disturbance to these species in the Project area. However, the Project area comprises a small proportion of available habitat for piscivorous birds in the South Bay. The Project impacts are considered to be **Less than Significant.** No mitigation measures would be required.

Alternative 6: No Project

Under the No Action Alternative, no construction-related impacts would occur. No mitigation is required for this alternative as there is **No Impact** under this alternative.

Impact TERRBIO-6: **Potential impacts to foraging habitat for diving and dabbling ducks.**

Summary - Common to all Alternatives

Diving ducks, such as lesser scaup (*Aythya affinis*), greater scaup (*Aythya marila*), bufflehead (*Bucephala albeola*), canvasbacks (*Aythya valisineria*), and other species, occur in the South Bay primarily during the nonbreeding season. These species forage in relatively shallow aquatic habitats in the South Bay, including shallow subtidal habitats, intertidal habitats (when flooded at high tide), and low-salinity managed ponds. Small numbers of lesser scaup breed in vegetated, nontidal wetlands in the San Francisco Bay Area, but this species occurs most abundantly as a migrant and winter resident.

Accurso (1992) found that most diving ducks occurred in water less than six meters deep, although some ducks occurred in much deeper waters. In all open water areas, diving ducks showed a preference (comparing habitat use to habitat availability) for waters less than three meters deep, but in the North Bay, Suisun Bay, and the Central Bay, this preference extended to depths up to five meters. In the Central Bay and South Bay open-water habitats, diving ducks occurred in densities roughly proportional to habitat availability up to a depth of 10 meters. Scoters occurred in slightly deeper water (occurring less in waters less than two meters), and canvasbacks occurred preferentially in waters less than three meters in depth.

Dabbling ducks are more abundant as breeders in the South Bay, but less abundant during the nonbreeding season, than diving ducks. Though not nearly as important to nesting waterfowl in the Bay Area as the Suisun Bay (Goals Project 1999; Harvey et al. 1992), the bayland habitats of the South Bay provide breeding habitat for several dabbling duck species, including the mallard (*Anas platyrhynchos*), gadwall (*Anas strepera*), cinnamon teal (*Anas cyanoptera*), northern pintail (*Anas* acuta), and northern shoveler (*Anas clypeata*). The South Bay is important to dabbling ducks primarily as a foraging area for migrant and wintering ducks. All of the breeding species are present in much greater abundance during the nonbreeding season than during summer and they are joined by large numbers of American wigeon (*Anas americana*) and green-winged teal (*Anas crecca*) during migration and winter. The most abundant dabbling ducks wintering in the South Bay are the northern shoveler, American wigeon, northern pintail, mallard, and gadwall (US Geological Survey Unpublished Preliminary Data). Shovelers are both abundant and flexible in habitat use in the South Bay, although they do not use tidal habitats frequently (Swarth et al. 1982).

Dabbling ducks forage in a variety of habitats in the South Bay, including mudflats, shallow subtidal habitats, tidal sloughs and marsh channels, marsh ponds, managed and muted tidal marsh, seasonal wetlands, managed ponds, and water treatment plants. In these areas, dabbling ducks feed on a variety of aquatic plants and invertebrates. Because these species do not typically dive for food, dabbling ducks usually forage in water less than 30 cm deep (Page 2001)

Construction and maintenance activities (e.g., vegetation and root mass removal, sediment dredging) associated with the Alviso Slough Restoration Project would involve the movement of heavy equipment, loud noise, and human presence in, and adjacent to existing tidal marsh and open water habitats. These activities may result in the disturbance of diving and dabbling ducks within those habitats, possibly causing short-term adverse effects. These effects include individuals fleeing areas adjacent to construction activities and a loss of foraging habitat associated with increased turbidity and removal of vegetation. Increased turbidity and changes to channel morphology related to vegetation removal and sediment dredging may temporarily reduce benthic foraging opportunities for diving and dabbling ducks in Alviso Slough. However, the removal of vegetation and deepening of Alviso Slough would have a minor beneficial effect for diving and dabbling ducks by opening up formerly dense marsh habitat into mud flat or shallow open water.

Impacts to wetland habitat and slough water quality may result in the loss of foraging habitat for dabbling and diving ducks, and the possible disturbance to these species in the Project Area. However, the Project area comprises a small proportion of available habitat for dabbling and diving ducks in the South Bay. The Project impacts are considered to be **Less than Significant**. No mitigation measures would be required.

Alternative 6: No Project

Under the No Action Alternative, no construction-related impacts would occur. No mitigation measures would be required for this alternative as there is **No Impact** under this alternative.

Impact TERRBIO-7: Potential impacts to special-status plant species.

Summary - Common Alternatives 1 through 5

No threatened or endangered plants are known or are expected to occur in the Alviso Slough Restoration Project area. Occurrences of five species (Congdon's tarplant, prostrate navarretia, alkali milk vetch, Contra Costa goldfields, and San Joaquin spearscale) have been documented within the Pacific Commons Preserve and the Warm Springs Unit of the Refuge in Fremont, and Congdon's tarplant has been recorded adjacent to Stevens Creek in 2002, in Alviso in other locations, and at the Sunnyvale Baylands Park not far south of Pond A8 (CNDDB 2006). Protocol-level pre-construction surveys for special status plants were conducted in summer 2004 and annual vegetation mapping of the project area for the City of San Jose are conducted annually in the summer months, during the blooming period of these special status plant species. None of the special status plant species in question were observed during the 2004 surveys or during the annual vegetation mapping. In addition, protocol-level surveys for Congdon's tarplant were conducted in all impact areas in October 2008 by two qualified botanists.

Suitable habitat does not occur for any special-status plant species within the Project area; although, with disturbance, marginal habitat could occur for Congdon's tarplant. However, the soil types and conditions likely to support Congdon's tarplant do not occur within the Project area, and only with disturbance, would low-quality, marginal habitat potentially become available for the species to become established. Because 1) no special-status plants are known to occur within the impact areas for the Alviso Slough Project Area, 2) any occurrence of special-status plant species is highly unlikely, and 3), the loss of a small, ephemeral population of Congdon's tarplant, the only species with any potential to occur within the study area, would be less-than-significant to the species, no significant adverse impacts to special-status plants are expected.

Impacts to Congdon's tarplant from the removal of freshwater marsh habitat is highly unlikely. However, in the rare event that wind-dispersed seed from known nearby populations of this species comes into a recently disturbed area within upland, alkaline soils (suitable habitat), it is possible that the plant could become established and likely that the population would be very small and ephemeral in nature. In addition, the species has not been observed during site surveys occurring annually from 2004 or in a protocol-level survey for the species conducted 20 October 2008. The Project impacts are therefore considered to be **Less than Significant**. No mitigation measures would be required.

Alternative 6: No Project

Under the No Action Alternative, no construction-related impacts would occur. No mitigation would be required for this alternative as there is **No Impact** under this alternative.

***Impact TERRBIO-8:* Potential colonization by non-native perennial pepperweed (*Lepidium latifolium*).**

Summary - Common Alternatives 1 through 5

Disturbance related to vegetation removal may result in increased colonization by non-native perennial pepperweed (*Lepidium latifolium*). Pepperweed exists downstream and within the Project area, indicating there is potential for colonization. There has been little study of the effects of perennial pepperweed colonization on native plant and animal communities. Because perennial pepperweed colonization occurs primarily in infrequently flooded, brackish marshes, it competes for resources with native brackish-marsh species such as bulrushes. Spautz and Nur (2004) studied the impacts of perennial pepperweed on tidal marsh birds in San Francisco Bay. Saltmarsh common yellowthroats were substantially more abundant in infested areas. Other species, such as song sparrows, marsh wrens, and California black rails, were not substantially more or less abundant in areas with perennial pepperweed, although potential benefits (e.g., higher territory densities and lower probability of flooding due to high tides), and adverse effects (higher depredation rates and lower nest success) on song sparrows were suggested, at least in some marshes.

BMPs to clean equipment and supplies to prevent the spread of seeds and plant material of non-native perennial pepperweed and other invasive plants would be implemented during construction and restoration activities. BMPs recommended for this Project include cleaning earth-moving equipment after use in infested areas, curtailing the movement or use of soil contaminated with seed, root fragments, or flower heads, and bagging any vegetative material containing perennial pepperweed fragments, drying, and burning at a landfill to prevent spread to other areas.

The removal of 2.6 to 25 acres of vegetation in Alviso Slough may result in the potential colonization of native habitat by perennial pepperweed. In addition, required maintenance (approximately every 3 years), requiring further disturbance to vegetation may provide habitat suitable for colonization by perennial pepperweed.

This impact is considered to be **Less than Significant** with the incorporation of the BMPs listed above and since the perennial pepperweed would be continually removed with the scheduled maintenance.

Alternative 6: No Project

Under the No Action Alternative, no construction-related impacts would occur. No mitigation would be required for this alternative as there is **No Impact** under this alternative.

***Impact TERRBIO-9:* Impacts to tidal marsh habitat through removal of vegetation and dredging.**

Summary - Common to all Alternatives

Freshwater marsh habitat present within Alviso Slough contains emergent wetland plants such as tules bulrushes (*Scirpus* spp.), and cattails (*Typha* spp.) within coastal freshwater tidal marsh habitat, and, as such, areas are protected as by the USACE and U.S. EPA under the Federal CWA, RWQCB under the

Porter-Cologne Act, BCDC, and local policies. Alviso Slough freshwater marsh habitat supports a wide diversity of plants, vertebrate animals, and invertebrates. Draining, diking, and development throughout the Bay area have adversely affected freshwater marsh habitats, and, as such, alteration or removal is not allowed without a clearly demonstrated purpose and need, project alternatives analyses to avoid or minimize impacts, and mitigation for unavoidable impacts required for any disturbance to this habitat.

Alternatives 1, 2, 3, 4, and 5

The removal of approximately 2.6 to 25 acres of vegetation would result in impacts to protected tidal marsh habitat. This Project would require maintenance approximately every 3-5 years, requiring further impacts to protected tidal marsh habitat. Because of the high quality of tidal marsh habitat, a mitigation ratio of 2:1 (mitigation: impact) would reduce impacts related to vegetation removal.
This impact is considered to be **Less than Significant with Mitigation**. The following mitigation measure would be implemented:

> **Mitigation Measure TERRBIO-B, 2:1 replacement of tidal marsh** (for 2.6 to 25 acres, respectively), applies here.

Alternative 6: No Project

Under the No Action Alternative, no construction-related impacts would occur. No mitigation is required for this alternative as there is **No Impact** under this alternative.

Impact TERRBIO-10: **Impacts to jurisdictional wetlands.**

Summary - Common to all Alternatives

Wetlands are regulated by numerous federal, state and local policies. For example, "Waters of the United States" (i.e., jurisdictional waters) are subject to the jurisdiction of the USACE. Alviso Slough is considered a navigable water as defined by the USACE. Activities affecting these areas would require permits from the USACE and the RWQCB under Sections 404 and 401 of the CWA.

Waters of the U.S. in Alviso Slough would be both temporarily and permanently impacted with on-going vegetation and root mass removal and, in some cases, additional dredging. Section 404 jurisdiction was found to extend to the high tide line (HTL) in the tidal areas.

In addition, the following local and regional policy documents were reviewed for consistency with the proposed Project:

ncorporates the Alviso Master Plan: A
Specific Plan for the Alviso Community
CCMP for the San Francisco Estuary
San Francisco Baylands Ecosystem Habitat Goals Report
The SFBP was developed by the San Francisco Bay Conservation and Development Commission

All of these policies support the preservation, enhancement, and restoration of tidal marsh habitats. Impacts to these habitats must be justified with a clear purpose and need, the impacts avoided or minimized, and mitigation provided for unavoidable impacts. Specifically, the SFBP includes the following:

> 1. Tidal marshes and tidal flats should be conserved to the fullest possible extent. Filling, diking, and dredging projects that would substantially harm tidal marshes or tidal flats should be allowed only for purposes that provide substantial public benefits and only if there is no feasible alternative.

Alternatives 1, 2, 3, 4, and 5

The removal of approximately 2.6 to 25 acres of vegetation in Alviso Slough would result in impacts to federally and state protected wetlands. This Project would require maintenance approximately every 3 to 5 years, requiring further impacts to federally and state protected wetlands. Because of the high quality of tidal marsh habitat, a mitigation ratio of 2:1 (mitigation: impact) would reduce impacts related to vegetation removal.

Impacts to wetland habitat would result in impacts to federally protected wetlands. This impact is considered to be **Less than Significant with Mitigation.** The following mitigation measure would be implemented:

> **Mitigation Measure TERRBIO-B, 2:1 replacement of tidal marsh** (for 2.6 to 25 acres, respectively), applies here.

Alternative 6: No Project

Under the No Action Alternative, no construction-related impacts would occur. No mitigation would be required for this alternative as there is **No Impact** under this alternative.

There are no known impacts to the movement of terrestrial wildlife species, with established native resident or migratory terrestrial wildlife corridors, or any impediment to the use of native wildlife nursery sites associated with this Project.

Impact TERRBIO-11: **Impacts related to Mitigation Measure TERRBIO-B, wetland creation.**

Summary - Common Alternatives 1 through 5

Implementation of specific restoration measures associated with the mitigation would result in minimal impacts to existing wetland habitats. Creation of wetland habitats would primarily involve modifications to the existing hydrology to convert barren salt ponds to vegetated plant communities. Mitigation proposed under TERRBIO-B would constitute such actions as levee breaching, placing fill into former salt ponds, and excavating small pilot channels. These minor impacts would be implemented with the sole intent of restoring large amounts of high quality habitat to offset the wetland impacts from the Project. If mitigation occurs through the SBSP Restoration program, impacts have been addressed under the environmental documentation specific to that project. If the District were to implement its own mitigation program such as at Pond A4, then a separate environmental document would need to be prepared.

Alternatives 1, 2, 3, 4, and 5

The creation of approximately 5.2 to 50 acres of wetland habitat in the vicinity of the study area would result in very minor impacts to tidal marsh habitat.

This impact is considered to be **Less than Significant** and no mitigation is proposed.

Alternative 6: No Project

Under the No Action Alternative, no mitigation activities would occur. No mitigation would be required for this alternative as there is **No Impact** under this alternative.

Impact TERRBIO-12: **Impacts related to the Mitigation Measures HYD-A and HYD-E, impacts to wetlands from hydrological mitigation measures.**

Alternatives 1, 2, 3, 4, and 5

With the use of sediment fencing and other erosion control measures, lowering of the levee/weir at Pond A8 (HYD-A) would only result in incidental fallback of materials into the adjacent wetland habitat.

The frequency of overtopping of the weir and subsequent flooding of Pond A8 is engineered to be the same as pre-construction conditions under all alternatives. Construction disturbance to adjacent sensitive species has already been addressed in TERRBIO-4.

In response to increased tidal flows and subsequent scour downstream in Alviso Slough, levee armoring adjacent to Pond A10 would result in less than significant impacts. There is currently a small amount of fringing marsh outboard of the levee along Pond A10. If levee armoring under HYD-E becomes necessary, the assumption is that this fringing marsh has already been lost due to increased scour. This loss of marsh is already being addressed in the SBSP Restoration Project for the Pond A8 Phase 1 action.

These impacts are considered to be **Less than Significant** and no mitigation is proposed.

Alternative 6: No Project

Under the No Action Alternative, no mitigation activities would occur under either impact. No mitigation would be required for this alternative as there is **No Impact** under this alternative.

Impact TERRBIO-13: **Impacts related to stockpiling of materials.**

Alternatives. 1, 2, 3, 4, and 5

Multiple stockpiling areas have been identified (see Figures 2-6 and 2-7 in Chapter 2). The majority of the sites proposed for stockpiling comprise ruderal and disturbed areas. These potential sites would be further evaluated prior to final selection for the presence of wetlands, special status plant species such as Cogdon's tarplant, as well as adjacency to habitat for nesting birds such as the federally listed western snowy plovers.

Impacts are considered to be **Less Than Significant with Mitigation.** The following mitigation measures ~~would~~ will be implemented:

- **Mitigation Measure TERRBIO-A, Construction timing to avoid breeding seasons, applies here.**
- **Mitigation Measure TERRBIO-C: Avoid western snowy plover breeding season, applies here.**

- **Mitigation Measure TERRBIO-D: Pre-construction special status plant species surveys.** Impacts to Congdon's tarplant from stockpiling of material is highly unlikely. However, in the rare event that wind-dispersed seed from known nearby populations of this species comes into a recently disturbed area within upland, alkaline soils (suitable habitat), it is likely that the population would be very small and ephemeral in nature. Areas proposed for the stockpiling of material shall be surveyed immediately prior to use. If special status plant species are located, an alternative stockpiling site shall be utilized, or protective fencing shall be installed around the sensitive plants.

In addition, the District has detailed internal guidance documents for their stream and levee maintenance work. All BMPs pertaining to work in channels would be applied to this Project.

Alternative 6: No Project

Under the No Action Alternative, no stockpiling would occur. No mitigation would be required for this alternative as there is **No Impact** under this alternative.

Impact TERRBIO-14: Impacts related to increased boat use.

Alternatives 1, 2, 3, 4, and 5

Improved recreational access to Alviso Slough is an important objective of the Alviso Slough Restoration Project (see Section 1.2.3). Alternatives 1, 2, 3, 4, and 5 would allow access to the existing SBYC boat dock that is currently inaccessible due to sedimentation and marsh colonization. This dock contains approximately 34 boat slips, most of which are expected be active if the Project is approved. Such access is important to the quality of life of Alviso residents and visitors. However, the use of the boat slips will result in an increase of recreational boat traffic in Alviso Slough and other connecting waters in the South San Francisco Bay. Increased boat traffic has the potential to increase shoreline erosion (summarized in Asplund 2000), resulting in the direct or indirect loss of marsh habitat along the edge of Alviso Slough. Boat traffic also has the potential to increase turbidity in water bodies for several hours after boating ceases (Yousef et al. 1980, Hilton and Philips 1982). Increased turbidity in Alviso Slough could disrupt normal patterns of foraging, breeding, and migration for steelhead (*Oncorhynchus mykiss*) and other fish species.

Increased boat use in the Alviso Slough and connecting waters has the potential to disturb wildlife and reduce the habitat value of the South Bay for certain species. Recreational boat use has been associated with the disturbance of diving ducks (Kahl 1991, Knapton et al. 2000), grebes (Bright et al. 2003), wading birds (Bratton 1990), nesting terns (Burger 1998), and other waterbird species. The effects of disturbance to waterbirds have been attributed to an increase in energetic demands (Ydenberg and Dill 1986, Frid and Dill 2002) and a reduction in foraging time (Stolen 2003, Thomas et al. 2003). In addition, boat traffic may occlude waterbirds from using certain habitats that otherwise would be available (Burger 1981, Peters and Otis 2006, Takekawa 2008).

Additional recreational boat use in the South Bay may also disturb Pacific harbor seals (*Phoca vitulina richardsi*) at haul out sites. There are more than 10 sites around the Bay that may be used by seals at any given time (Lidicker and Ainley 2000), including two sites within close proximity to Alviso Slough: Calaveras Point, near the mouth of Coyote Creek, and Guadalupe Slough near the northeastern end of

Pond A3N. Other haul-out sites include Mowry Slough, Castro Rocks, Yerba Buena Island, Bair Island, and Greco Island (Bell Unpublished; Fancher and Alcorn 1982, Kopec and Harvey 1995). Marine mammals, like harbor seals, are protected under the federal Marine Mammal Protection Act, and they are known to be sensitive to human disturbance, including disturbance created by recreational boat use (Snyder Fox 2008). Disturbance can lead to separation of pups from nursing mothers, can add physiological stress to adults, and can lead to long-term abandonment of historic haul-out sites (Lidicker and Ainley 2000). NOAA Fisheries recommends a 100-yeard disturbance-free buffer around harbor seals.

Despite the additional boat use associated with access to the existing SBYC boat dock, the Project is not expected to significantly increase shoreline erosion, disrupt steelhead behavior, or disturb waterbirds or harbor seals in the South Bay. However, see Section 4.2.2 for cumulative impacts associated with the Project and other foreseeable projects in the Alviso Slough area.

This impact is considered to be **Less than Significant** and no mitigation is proposed.

Alternative 6: No Project

Under the No Action Alternative, no mitigation would be required for this alternative as there is **No Impact** under this alternative.

Impact TERRBIO-15: **Impacts to bird reproduction as a result of increased mercury methylation and bioaccumulation.**

Summary - Common to all Alternatives

As discussed in Section 3.2 under impact WQ-3, preliminary findings of the South Baylands Mercury Project indicate that mercury near the surface (i.e., upper 6 inches of sediment) is much more reactive than mercury at depth (i.e., below 6 – 12 inches). Therefore, even though total mercury concentrations at depth are comparable to those at the surface, activities that bring deeper sediments to the surface could increase the amount of reactive mercury in those deeper sediments, ~~potentially causing a transient or longer-term "spike" in the production of methylmercury~~. causing a transient increase in the production of methylmercury. The duration of the increased methylmercury production is difficult to predict, i.e., it is unknown whether equilibrium comparable to pre-project conditions would take weeks, months, or years. ~~It is not known for certain that this increase in reactive mercury would result in an increase in the methylation rate.~~

Recent findings of the USFWS show that some bird species in the South Bay are already at risk of reproductive impairment due to mercury (Eagles-Smith et al., 2007). These species include the Forster's tern, the stilt, and the Caspian tern. An increase in the mercury content of the diet of these at-risk species could cause declines at the population level for the duration of the transient increase in methylation following the disturbance of sediment.

Based on the findings of the South Baylands Mercury Project ~~Study~~, it is ~~possible that dredging would increase available mercury. However, net mercury methylation is a product of mercury availability and mercury methylation rates. A concurrent finding discussed in coordination meetings with the South Baylands Mercury project is that removing vegetation root mass density decreases mercury methylation~~

~~rates by reducing bacterial activity (Windham-Myers and Marvin-Dipasquale, 2007). Therefore, under all project alternatives, any disturbance that leads to a transient increase in mercury availability is predicted to be offset by a decrease in methylation rates in the Project area. The net decrease in methylation rates would ensure that mercury concentrations in bird eggs would not increase. As such, the project would have~~ ~~**less than significant**~~ ~~impacts on net mercury methylation.~~ highly probable that vegetation removal or dredging will increase available mercury. Based on that probability, it is likely, but less certain that the increase in available mercury, would lead to a transient increase in net methylmercury production. Should an increase in net methylation occur, it is possible, but again, not certain, that a significant increase in mercury bioaccumulation would occur. To be conservative, given the uncertainties, it is assumed that disturbance due to vegetation removal or dredging will cause a potentially significant increase in mercury methylation and bioaccumulation. If there is a detectable increase in the mercury concentrations of bird eggs above the threshold for significance, this can only be mitigated at the population level over a longer term by restoring foraging habitat. Therefore, if there is an impact, the available mitigations are not sufficient to bring this impact below the threshold of significance. This impact is considered **Significant** after implementation of Mitigation Measures WQ-C and TERRBIO-B (See Sections 3.2.3 and 3.4.3 for a detailed description of WQ-C and TERRBIO-B, respectively).

Alternatives 1, 2, 3, 4, and 5

Alternatives 1 through 5 include vegetation and root mass removal and, for Alternatives 3, 4, and 5, dredging. Vegetation and root mass removal and dredging may result in short-duration exposure of sediments in the construction area. Use of the turbidity screen would limit the area of exposure and the sediments are expected to settle quickly. Surface sediments disturbed by vegetation removal are expected to have total mercury concentrations comparable to ambient sediments in the Project area. Deeper sediments exposed by dredging may have similar or higher concentrations of total mercury. The deeper sediments would not remain exposed as sediment deposition during slack water would cover them. ~~There may be some transient increase in the amount of reactive mercury as currently buried sediments are brought to the surface. The effects of a potential increase in reactive mercury on methylmercury production are expected to be transient and offset by the reduction in methylmercury production by the removal of vegetation and root mass and the associated bacteria that induce methylation.~~ It is highly probable that vegetation removal or dredging will increase available mercury. It is likely, but less certain, that the increase in available mercury would lead to a transient increase in net methylmercury production. This impact is considered ~~**Less than**~~ **Significant** after implementation of Mitigation Measures WQ-C and TERRBIO-B (See Sections 3.2.3 and 3.4.3 for a detailed description of WQ-C and TERRBIO-B, respectively).

Alternative 6: No Project

Alternative 6 would not include any vegetation removal from the slough. Therefore a reduction in methylmercury production associated with vegetation root zones would not occur. Alternative 6 would not result in any perturbation from the current configuration. This is considered **No Impact**.

3.4.4 Relationship to South Bay Salt Ponds Phase 1 Action at Pond A8

Implementation of the proposed SBSP Phase 1 Action at Pond A8 would restore a more natural process of tidal scour that would, at least partially, deter re-establishment of marsh vegetation that may be removed as part of the SBSP Phase 1 Action or the Alviso Slough Restoration Project. However, the degree of sustainability would depend on the ability to increase notch operations from an initial 20-foot wide opening up to 40-feet wide over the lifetime of the SBSP Phase 1 Action; sustainable open channel area could be minimal if operation of the Phase 1 notch does not progress toward a 40-foot opening.

The location of the Phase 1 notch would have important implications for vegetation removed as part of the Alviso Restoration Project as well, as scouring of the slough would not occur upstream of the constructed notch, and such an area would not benefit from the self-maintenance provided by increased tidal scour.

Over the long-term (10 years and beyond), future SBSP phases would increase the width of Alviso Slough channel, if Pond A8 were restored to full tidal action. In the event that results from the ongoing South Baylands Mercury Project indicate that ecological risk associated with mercury toxicity in wildlife is unacceptable, Pond A8 may be managed as a non-tidal pond. Under this scenario, the notch may be closed and, thus, vegetation and sediment removal as a result of Pond A8-induced scour would not be sustained (EDAW 2007).

All alternatives would have the same or reduced levels of impact with the implementation of the Pond A8 Phase 1 project for TERRBIO Impacts 1 through 15. Reduced impacts may occur if the Pond A8 project precedes the Alviso Slough project as scour of marsh may result in a reduction of wetland habitat removed or a reduction in the frequency of future maintenance activities.

Alternative 1: Vegetation and Root Mass Removal (2.6 acres)

Scouring by the Phase 1 actions at Pond A8 may reduce the acreage that would need to be cleared under this alternative, and reduce the level of on-going maintenance that is required. The Alviso Slough channel is predicted to have 140 feet of open water at the Project reach compared to 85 feet on average with Alternative 1 alone, and 150 feet wide in 1983.

Alternative 2: Vegetation and Root Mass Removal (7.0 acres)

Tidal scour associated with the proposed SBSP Phase I action at Pond A8 is expected to reach 90 feet near the SBYC docks over time, if notch operations allow for the opening to increase to 40-feet wide. The Alviso Slough channel is predicted to have 140 feet of open water at the Project reach. However, it is anticipated that some ongoing mechanical maintenance would be required to sustain the 7-acre footprint of vegetation and root mass removal as the areas of vegetation upstream of the Pond A8 notch to the Gold Street Bridge would not be scoured by the increased tidal prism. The 7 acres of wetland removal would alone create an open water width of an estimated 130 feet, but over a greater distance upstream than the SBSP Phase 1 notch.

Alternative 3: Vegetation and Root Mass Removal (3.7 acres) with dredge to 8-foot depth

Scouring by the Phase 1 actions at Pond A8 may reduce the acreage that would need to be cleared under this alternative, and reduce the level of on-going maintenance that is required. The Alviso Slough channel is predicted to have 140 feet of open water at the Project reach compared to 95 feet on average with Alternative 3 alone, and 150 feet wide in 1983.

Alternative 4: Vegetation and Root Mass Removal (6.2 acres) with dredge to 16-foot depth

Scouring by the Phase 1 actions at Pond A8 may reduce the acreage that would need to be cleared under this alternative, and reduce the level of on-going maintenance that is required. A deep dredging, concurrent with the implementation of the SBSP Phase I action in Pond A8, could provide enhanced navigation benefits for a period of up to 10 years (an initial 16-ft depth would gradually decrease as sedimentation occurs over time) until a full breach of Pond A8 could occur. The Alviso Slough channel is predicted to have 120 feet of open water at the Project reach compared to 115 feet on average with Alternative 4 alone, and 150 feet wide in 1983. Once Pond A8 tidal action is fully restored, Alviso Slough would be further deepened and widened by tidal scour.

Alternative 5: Vegetation and Root Mass Removal (15.3 acres) to 4-foot depth and additional dredging (9.7 acres) to a 10-foot depth

Although as described above, if SBSP Phase I actions at Pond A8 are fully implemented (i.e. the entire 40-ft notch is open year-round or full tidal action is restored), approximately 3 to 5 acres of habitat within the Alviso Slough Restoration Project area would scour, depending on the size, management, and success of the notch operation, scour action would not sustain much of the proposed tidal marsh removal under this alternative. A deep dredging, concurrent with the implementation of the SBSP Phase I action in Pond A8, could provide enhanced navigation benefits for a period of up to 10 years (an initial 10-ft depth would gradually decrease as sedimentation occurs over time) until a full breach of Pond A8 could occur. The Alviso Slough channel is predicted to have 140 feet of open water at the Project reach compared to 160 feet on average with Alternative 5 alone, and 150 feet wide in 1983. The additional former wetland area would be maintained as tidally exposed mudflat under Alternative 5. Once Pond A8 tidal action is restored, Alviso Slough would be further deepened and widened by tidal scour.

Alternative 6: No Project

If the SBSP Phase I Action is implemented and successful over the long term, tidal scour in Alviso Slough would likely increase the current channel width by 50 to 90 feet in the vicinity of the SBYC and deepen the channel invert. The Alviso Slough channel is predicted to have 140 feet of open water at the Project reach compared to 150 feet wide in 1983. These changes would be self-sustaining as long as tidal exchange between Pond A8 and Alviso Slough continued.

3.4.5 Sediment Disposal Options

Sediment disposal options include trucking, barging, or conveying (e.g., slurry pipeline) the dredged sediment to a location where it could be re-used. Reuse of the sediment by barging or conveying is dependent on sediment chemical characteristics. Otherwise, sediment must be trucked to a landfill, such as Newby Island Landfill, as described in Chapter 2.

These disposal options would result in similar construction impacts as considered above and would require the same or similar mitigation measures. However, a re-use solution where the sediment would not require drying at the proposed staging areas in Alviso would alleviate potential impacts to biological resources associated with staging areas. Additional mitigation measures might be necessary to cover potential impacts associated with construction of a slurry pipeline on levee tops and possibly within wetland fringe areas.

This page intentionally left blank.

3.5 PUBLIC HEALTH AND VECTOR MANAGEMENT (VECTOR)

3.5.1 Regulatory Setting

A description of agency jurisdiction and involvement in vector management is provided below.

Table 3.5-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
FEDERAL	
None	
STATE	
None	
LOCAL	
County of Santa Clara **Department of Environmental Health** **Vector Control District**	The Santa Clara County Vector Control District was formed in 1988 and is one of ten special districts located in the Greater San Francisco Bay Area. These special districts are charged with providing mosquito and general vector control pursuant to California Health and Safety and California Government Codes. The District is one of six special districts in the State wherein the County Board of Supervisors acts as Trustee and funding is through a special property tax assessment. The District provides: – Detection of the presence/prevalence of vector borne diseases, such as West Nile Virus, rabies, & Lyme disease, through planned tests, surveys and samples; – Routine inspection and treatment as necessary, of known mosquito and rodent sources; – Response to customer initiated service requests for identification, advice, and/or control measures for mosquitoes, rodents, wildlife, and miscellaneous invertebrates (ticks, yellowjackets, cockroaches, bees, fleas, flies, etc.); – Educational presentations for schools, homeowners associations, private businesses, civic groups and other interested groups; and – Informational material on all vectors and vector borne diseases

3.5.2 Physical Setting

An extensive body of literature exists on the mosquitoes associated with the tidal and seasonal wetlands of the South San Francisco Bay region, as summarized by Bohart and Washino (1978), Durso (1996), and Maffei (2000d; 2000e; 2000f; 2000g; 2000h). These and other resources, including personal communications with vector control specialists in the South Bay, were reviewed to develop this analysis.

Regional

More than 20 species of mosquitoes occur in the San Francisco Bay Area, but five species, the summer salt marsh mosquito (*Aedes dorsalis*), winter salt marsh mosquito (*Aedes squamiger*), Washino's mosquito (*Aedes washinoi*), western encephalitis mosquito (*Culex tarsalis*), and winter marsh mosquito (*Culiseta inornata*), are routinely controlled by the mosquito and vector control agencies within each of the counties of South San Francisco Bay. Within the Alviso Slough Restoration Project area, the Santa Clara Vector Control District is responsible for managing the populations of mosquitoes.

The ecology of these mosquitoes, including preferred habitats, salinity tolerances, reproductive rates, flight characteristics, adult hosts and vector/nuisance potential were summarized in detail for the Goals Project's Baylands Ecosystem Species and Community Profiles (Maffei 2000d; 2000e; 2000f; 2000g; 2000h).

Within the San Francisco Bay Area, the summer salt marsh mosquito occurs primarily in "temporarily flooded tidal marsh pans, heavily vegetated ditches and brackish seasonal wetlands," while adults occur in open habitats such as grasslands, salt marsh, and woodland edges (Maffei 2000d). The summer salt marsh mosquito lays its eggs on mud at the edges of tidal pools or brackish seasonal wetlands, with larvae often occupying the same pools occupied by the tidal pool brine fly (*Ephydra millbrae*) and reticulate water boatman (*Trichocorixa reticulata*) (Maffei 2000d). Eggs may hatch in the spring, but they can remain viable for years, and subsequent hatching can occur when the larval habitat is re-flooded. Although survivorship may be highest in water having a salinity near seawater (Washino and Jensen 1990), larvae have successfully completed development at the Great Salt Lake in water with salinities as high as 120 parts per thousand (ppt) (Rees and Nielsen 1947). Adults are highly mobile, aggressive, day-biting mosquitoes that may be able to disperse more than 30 miles (Rees and Nielsen 1947).

The winter salt marsh mosquito occurs along the Pacific Coast from Sonoma County south to Baja California, including much of the area around the immediate South and North San Francisco Bays (Maffei 2000h). Tidal and diked pickleweed marshes with salt marsh pools diluted by rains provide the preferred habitat of this species. This species has not been found in freshwater marshes, instead occurring in brackish and salt marshes having salt concentrations from 1.2 to 35 ppt, with optimal conditions for larval development at salinities of 5 to 15 ppt. Egg-laying occurs in spring on plants and on mud close to the edges of marsh pools. The eggs lie dormant until fall rains inundate them, although hatching as early as late September has been noted due to water diversion into a marsh. Some eggs do not hatch until later re-floodings. Most adults emerge from salt marsh pools in late February and March and disperse widely into surrounding areas, sometimes dispersing as far as 15 miles or more from larval areas. Feeding occurs from March through June, with biting occurring during daytime and early dusk.

Washino's mosquito occurs from Oregon south to Santa Barbara, California, including the entire San Francisco Bay Area (Maffei 2000e). In the Bay Area, shallow pools and fresh to slightly brackish sites in uplands near salt marshes or in riparian areas, often dominated by willow, cottonwood, or blackberry, provide this species' preferred habitat. Females deposit eggs in mud along the receding water line of larval habitat. The eggs hatch when these pools are reflooded the following winter. Adults emerge from the larval depressions in late winter and early spring, and are present into June. Females are day-biting mosquitoes, and may travel up to 1.5 miles from their larval habitat along artificial canals (Maffei 2000e).

The western encephalitis mosquito is widespread in a variety of habitats and locations in western North America, with larvae occurring in most freshwater habitats (Maffei 2000f). Typical larval habitat includes poorly drained fields and pastures, rice fields, marshes, ponds, and seeps, although most artificial waterbodies in urban areas provide potential habitat for this species as well. The species has been found to occur in salt marsh pools with salt concentrations up to 10 ppt (Telford 1958). Adults may be present year-round but enter facultative diapause (period of physiological dormancy) in winter. Females lay eggs in groups directly into the water. Adult females usually feed at night. This species seems to be able to disperse readily with wind, and dispersal distances of 20 to 25 miles are suspected for some Sacramento Valley populations (Bailey et al. 1965). The western encephalitis mosquito is the main vector of western equine encephalitis and St. Louis encephalitis in most of the western United States (Maffei 2000f), and is a vector of avian malaria.

The winter marsh mosquito occurs in a wide range of habitats throughout much of western North America. Larval habitat includes a variety of pools, ponds, marshes, and other water bodies, in salinities ranging from 8 to 26 ppt (Maffei 2000g; Telford 1958). Adults are present from fall through spring, entering facultative diapause (a form of hibernation) in summer. Females lay groups of eggs directly on the water. San Francisco Bay populations tend to remain within two miles of their larval source, although dispersal up to 14 miles is known (Clarke 1943). Larvae of the summer salt marsh mosquito, winter salt marsh mosquito, and winter marsh mosquito are often found in the same locations (Maffei 2000h).

Project Area

Mosquito species occurring in the major habitats in the Alviso Slough Restoration Project area are listed in Table 3.5-2.

Table 3.5-2 Mosquito Species Found in Marsh Habitats in the vicinity of the Alviso Slough Restoration Project Area

Habitat	Mosquito Species
Open salt pond with vigorous wave action	none
Fully tidal salt marsh: Higher ground with pools or borrow channels that do not flush	*Aedes squamiger* (winter), *Aedes melanimon* (fall), *Aedes dorsalis* (summer), *Aedes taeniorhynchus* (summer), *Culiseta inornata* (winter)
Muted tidal salt marsh: Pools and channels that do not flush vigorously	*Aedes squamiger* (winter), *Aedes melanimon* (fall), *Aedes dorsalis* (summer), *Aedes taeniorhynchus* (summer), *Culiseta inornata* (winter)
Seasonal wetland: Brackish to nearly fresh water pools with vegetated margins	*Aedes squamiger* (winter), *Aedes melanimon* (fall), *Aedes dorsalis* (summer), *Aedes taeniorhynchus* (summer), *Aedes washinoi* (winter fresh water), *Culex tarsalis* (spring, summer), *Culex erythrothorax* (summer in tules), *Culex pipiens* (foul fresh water), *Culiseta incidens* (spring, fall fresh water), *Culiseta inornata* (winter)
Vernal pools, upland fresh water marsh	*Aedes washinoi* (winter), *Culex tarsalis* (spring, summer), *Culex erythrothorax* (summer in tules), *Culex pipiens* (foul fresh water), *Culiseta incidens* (spring, fall fresh water), *Culiseta inornata* (winter)

Marshes that lack vigorous tidal flow can provide suitable mosquito breeding habitat. Salt marshes at the southern end of the San Francisco Bay produce a single seasonal brood of the winter salt marsh mosquito and multiple broods of the summer salt marsh mosquito each season. Because both of these mosquito species can fly considerable distances and are aggressive biters, control of mosquitoes at the source (i.e., in salt marshes) is necessary to reduce the inconvenience to humans in the South Bay.

Detailed records are maintained by the local mosquito and vector control districts concerning major mosquito breeding areas, population densities, and control techniques and materials. In Santa Clara County, areas with known or potential mosquito problems include Coyote Reach 1A, New Chicago Marsh, Sunnyvale Baylands Park, the Moffett Field Flood Control Basin, Mountain View Demonstration Marsh, the Palo Alto Flood Basin (Palo Alto Baylands Park), the Zanker Landfill Marsh, Dow-Corning Marsh, Alviso area salt marshes, ITT Marsh (near the Palo Alto Water Quality Control Plant), the Palo Alto Municipal Airport, and the Palo Alto Municipal Golf Course (Strickman 2005).

Mosquito control techniques employed by these agencies emphasize minimization and disruption of suitable habitat, and control of larvae through chemical and biological means, as opposed to spraying of adults. Control techniques most often include source reduction, source prevention, larviciding, use of mosquito fish (*Gambusia affinis*) as larval predators, and monitoring of mosquito populations and vector-borne diseases (Alameda County Mosquito Abatement District 1999). In salt marshes, attempts to control mosquito populations by ditching have resulted in marsh degradation. Ditching is not necessary to reduce mosquito populations in tidal marshes. Rather, functional tidal marshes do not provide high-quality habitat for the most troublesome mosquito species in the Bay Area, and maintenance and restoration of natural tidal flushing in these marshes is effective at limiting mosquito populations while sustaining the natural hydrology of the marsh (San Francisco Bay Joint Venture 2004).

Mosquitoes serve as vectors for several diseases that pose health concerns for humans and domestic animals. The western encephalitis mosquito is a vector of avian malaria and the main vector of western equine encephalitis and St. Louis encephalitis in the western United States (Maffei 2000f). Anopheles mosquitoes carry the organism that causes malaria. The West Nile virus is a mosquito-borne disease that has been found in parts of Asia, Eastern Europe, Africa and the Middle East. First detected in the US in 1999 in New York City, West Nile virus has since spread through most of the US. West Nile Virus is typically spread from an infected mosquito, usually in the genus *Culex*, to a bird that then disperses or migrates, spreading the virus after being bitten by other mosquitoes. Most people and domestic animals that become infected with the virus have few or no symptoms, but in rare cases they can become seriously ill. To date, four human cases of West Nile virus have been reported in Santa Clara County. West Nile virus has also been detected in 83 birds, 6 tree squirrels and mosquitoes collected in 10 traps in the County (http://www.sccgov.org/portal/site/vector/).

3.5.3 Environmental Impacts and Mitigation

Significance Criteria

For the purposes of this analysis, significant impacts would occur if the project would:

- Increase substantially the need for vector management activities in the Community of Alviso or the Alviso Slough Restoration Project Area, as a result of Project activities.

Impacts and Mitigation

The impacts analysis in this ~~Draft~~ Final EIR evaluates five action alternatives and the required No Project alternative. The action alternatives include vegetation removal and/or dredging, as described in Chapter 2. Under the No Project alternative, the District would not take any action in the Project area and existing programs would continue. The analysis covers impacts from the construction and maintenance phases– both in the slough and at staging areas.

All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by BCDC, CSLC, the District, or SBYC by the time of commencement of construction of this Project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Table 3.5-3 lists each impact identified for the proposed alternatives, along with the significance of each impact. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (less than significant and does not require mitigation), or Class IV (beneficial). Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections.

Table 3.5-3 Impact and Mitigation Summary

Impact	Impact Significance	Mitigation Measures
Impact VECTOR-1: Increase in Breeding Habitat.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact VECTOR-2: Increase in Breeding Habitat from Wetland Mitigation.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Note: The impacts and mitigation would be the same both with and without the SBSP Restoration Project.		

***Impact VECTOR-1:* Increase in Breeding Habitat.**

Summary - Common to all Alternatives

Stockpiled material may create small areas of ponding water that could provide additional mosquito breeding habitat in the short-term. Dredged sediment and vegetation would require drying prior to disposal at the appropriate facility. The staging area and dewatering stockpiled sediments may accumulate standing water, which could possibly attract breeding mosquitoes to the vicinity. However, the risk of increased mosquito presence associated with the drying process is expected to be minimal in scale and temporary in duration. Furthermore, the stockpiled sediment would be turned regularly to assist in the drying time (10 days) before being hauled to the disposal facility.

In addition to marsh vegetation removal, the Alviso Slough Restoration Project is expected to increase the tidal prism and water circulation in the localized area of Alviso Slough. The marsh vegetation in this reach of Alviso Slough is narrow and well-drained, thereby not posing a significant risk for mosquito breeding. However, the loss of vegetative structure coupled with the increased flow in the slough may somewhat reduce the probability of mosquitoes breeding within the Project area.

Ground fogging to suppress adult mosquitoes is done by truck-mounted units that apply five grams of an organic insecticide (Pyrenone 25-5 Public Health Insecticide) in front of an average house. Fogging is done in areas where West Nile virus infected mosquitoes are found, normally between 11:00 p.m. and 4:30 a.m. This procedure was designed in the 1960s to kill the most mosquitoes with the least insecticide by applying droplets of exactly the right size. This procedure is approved by the U.S. EPA, the State of California, and the County of Santa Clara. No changes in the necessary mosquito control activities are expected as a result of the Project..

Alternatives 1, 2, 3, 4 and 5

Because mosquito nuisance is not considered do to be an issue at present, and the Project would not result in significant new breeding areas, this impact is considered **Less than Significant**.

Alternative 6: No Project

Alternative 6 would not result in any dredged sediment of removed plant material. There would be **No Impact.**

Impact VECTOR-2: **Increase in Breeding Habitat from Wetland Mitigation.**

Summary - Common to all Alternatives

An increase in vegetated wetlands could potentially result in increased mosquito populations, if these wetlands do not drain properly. However, well-drained tidal wetlands are not expected to host large mosquito populations, and restoration of tidal wetlands possessing extensive channel networks may not increase mosquito numbers substantially. The tidal restoration that would occur under any wetland mitigation scenario would target the restoration of well-drained marshes. Restoration techniques such as breaching pond levees in the locations of remnant sloughs and blocking borrow ditches would be implemented to facilitate the development of well-drained marshes.

In contrast, diked, vegetated seasonal wetlands typically support high mosquito densities in the South Bay, requiring intensive vector control efforts.

Although well-drained tidal marshes are not expected to increase mosquito production, marsh ponds and pannes that are vegetated may support mosquitoes. In addition, upland transition zones that may be created along the upper edges of restored marshes could potentially provide pools that may support mosquitoes. These habitat features should be considered carefully in mitigation planning to discourage the addition of significant new potential breeding areas for mosquitoes.

Alternatives 1, 2, 3, 4 and 5

Because well-drained marshes would be the target of any wetland mitigation performed for this project, and the Project would not result in significant new breeding areas, this impact is considered **Less than Significant**.

Alternative 6: No Project

Alternative 6 would not result in any wetland mitigation. There would be **No Impact.**

3.5.4 Relationship to South Bay Salt Ponds Phase 1 Action at Pond A8

Impact VECTOR-1: **Increase in Breeding Habitat.**

Alternatives 1, 2, 3 4 and 5

With successful implementation of the Phase 1 Action at Pond A8, there is a possibility that less maintenance would be needed over the Project timeframe. In this case, less sediment would need to be stockpiled, thereby reducing the likelihood (already remote) of increasing breeding habitat. This impact is considered **Less than Significant**.

Alternative 6: No Project

Alternative 6 would not result in any dredged sediment of removed plant material. There would be **No Impact.**

The impacts identified above for Impact VECTOR-2 would be the same with or without the Phase 1 Action at Pond A8.

3.5.5 Sediment Disposal Options

Sediment disposal options include trucking, barging, or conveying (e.g., slurry pipeline) the dredged sediment to a location where it could be re-used, rather than trucking the material to the Newby Island Landfill, as described in Chapter 2.

These disposal options would result in similar impacts as considered above. However, by not needing to stockpile the material at staging areas and barging it offsite, any potential impacts in terms of mosquito breeding would be reduced for visitors and residents in Alviso.

This page intentionally left blank.

3.6 GEOLOGY AND SOILS (GEOL)

This section describes the geology, soils, and seismic hazards at and in the vicinity of the project site. The Regulatory Setting describes the pertinent federal, state, and local regulations and policies related to geology and geologic hazards. The Physical Setting presents existing conditions with respect to the regional and Project area geology, including general topography, geologic materials, and structural geology (faults). The Environmental Impacts and Mitigation defines the significance criteria and presents a discussion of impacts.

3.6.1 Regulatory Setting

Geologic resources and hazards are governed primarily by state and local jurisdictions. Seismic hazards are addressed by state and local requirements for identifying and avoiding faults when considering new development.

Table 3.6-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
FEDERAL	
U. S. Army Corps of Engineers *Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403)*	Requires applicant to obtain a permit to construct a dike or dam in navigable waters of the United States, including the excavating from or depositing of material in any such waters.
STATE	
California Geological Survey *Alquist-Priolo Earthquake Fault Zone Act*	Requires the delineation of zones along active faults in California. The purpose of the Alquist-Priolo Act is to regulate development on or near fault traces to reduce the hazard of fault rupture and to prohibit the location of most structures for human occupancy across these traces
California Geological Survey *Seismic Hazard Mapping Act*	The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and from other hazards caused by earthquakes.
LOCAL	
None	

3.6.2 Physical Setting

Alviso Slough is located in the far South San Francisco Bay where the Guadalupe River discharges into the tidal slough in northern Santa Clara County, California. The Project area is located immediately west of the Community of Alviso which is situated on the east bank of Alviso Slough. The Project area extends from Gold Street Bridge west and then north to Alviso Marina County Park (see Figure 1-2). The levee between Alviso Slough and the town site is a publicly-maintained flood control levee, distinguished from the privately owned salt ponds and levee system located west and north of the Project area.

The Lower Guadalupe River and Alviso Slough traverse a broad gently sloping alluvial plain filled with sediments derived from fluvial sources and deposited in alternating estuarine and marine (bay) environments as sea levels fluctuated. Alviso Slough is 300 to 500 feet wide although the open channel measures only 50 to 75 feet wide. Elevations in the Alviso community range from +1 to +4 feet and the levees bounding Alviso Slough reach elevation +12 to +16 feet. The area is essentially flat except for the slopes descending to Alviso Slough at sea level.

Regional

Alviso Slough and the surrounding mudflats, marshlands, sloughs and salt evaporation ponds are located in South San Francisco Bay which lies within the Coast Ranges geomorphic province. The major geographic features in the area include the Diablo Range, Santa Cruz Mountains, San Francisco Peninsula, and San Francisco Bay. The province consists of northwest-trending mountain ranges, broad basins, and elongated valleys generally parallel to the San Andreas fault. In the Coast Ranges, older, consolidated rocks are exposed in the mountains but are buried beneath younger, unconsolidated alluvial fan and fluvial sediments in the valleys and lowlands. San Francisco Bay occupies a late Pliocene structural depression that extends south of the Project area and underlies Santa Clara Valley.

Basement rocks underlying San Francisco Bay are generally exposed in the mountains of the northern Diablo Range and San Francisco Peninsula. The bedrock in the ranges includes Franciscan Complex of Jurassic and Cretaceous age, the Cretaceous-Early Tertiary Great Valley Sequence, and Tertiary age sedimentary units. Franciscan Complex rocks include sandstone, shale, conglomerate, greywacke sandstone, chert, greenstone, and serpentinite. Rocks of the Great Valley Sequence are generally located on the margins of the Diablo Range and consist of shale and sandstone with minor amounts of conglomerate. Tertiary marine sedimentary rocks of sandstone, siltstone and shale overlie the Great Valley Sequence in the Diablo Range and overlie the Franciscan complex in the San Francisco Peninsula. Alluvium and alluvial fan deposits flank the hillside areas and extend to the bay margins where they interfinger with fine-grained sediments deposited in estuaries, tidal flats and bay mud.

Structural geology in the region is dominated by major active strike-slip faults associated with the San Andreas Fault System. The geologic structure of the San Francisco Bay and Santa Clara Valley is characterized as a structural trough bounded by two uplift blocks forming the Diablo Range and East Bay Hills on the east, and the Santa Cruz Mountains on the west. The region is tectonically and seismically active.

Project Area

Faults

There are no major or active faults identified in the project vicinity (USGS 2007). The project is located about 7.5 miles east of the active Monte Vista-Shannon fault in Palo Alto and 6.0 miles west of the active Hayward fault in Fremont. In addition, the project is located between two late Quaternary faults (not active) that parallel the northwest structural trend. The San Jose fault to the west and the Silver Creek fault to the east lie at the margins of Santa Clara Valley and are buried and concealed by the late Quaternary and Recent sediments deposited in structural depression (Jennings 1994; Graymer et al, 2005).

Seismicity

Alviso Slough is located in south San Francisco Bay Area, a region with both active and potentially active faults and intense seismic activity. The 1997 Uniform Building Code (UBC) locates the entire Bay Area within Seismic Risk Zone 4. Areas within Zone 4 are expected to experience maximum magnitudes and damage in the event of a major ($M \geq 6.7$; M=moment magnitude) earthquake. The U.S. Geological Survey (USGS) Working Group on California Earthquake Probabilities has evaluated the probability of one or more earthquakes of Richter magnitude 6.7 or higher occurring in the San Francisco Bay Area within the next 30 years. The Working Group evaluation indicated a 62 percent likelihood that such an earthquake event will occur in the Bay Area between 2002 and 2031 (USGS 2003). Peak ground accelerations of 0.45 to 0.67g[1] are estimated for the Project area (CGS 2007).

Geologic Units

The geologic units near Alviso Community are a Holocene age transgressive sequence of distal alluvial fan, fan-delta, and estuarine deposits that merge and interfinger with bay mud-tidal flat deposits (Helley and Graymer, 1997; Witter et al, 2006). Man-made or artificial surficial deposits include artificial levees and artificial fill over bay mud or estuarine deposits (CGS 2001; Witter et al, 2006).

The Alviso community is underlain by artificial fill placed on bay mud. Bay mud is considered by the California Geological Survey (CGS,2001) to be estuarine deposits that are essentially non-marine. Bay mud also underlies the slough and the salt ponds located north and west of the Project area (CGS 2001; Witter et al, 2006). Bay mud is predominantly clay with minor amounts of silt, very fine sand and organic matter. The clay has low strength and is compressible. Sand lenses within the bay mud deposits have a moderate susceptibility to liquefaction in the Project area (Witter et al, 2006).

Artificial levees at the Project area include the man-made flood control levee adjacent to Alviso community and the low-density, low-strength levees at the margins of the salt ponds. Available geotechnical and geologic data for the project site and vicinity and a levee stability assessment prepared for this project indicate that the existing man-made flood control levee adjacent to the Alviso community were constructed from in-place lean clays[2] . The foundation material beneath the levees appears to be lean to fat clay[3]. It is likely that the levees were neither engineered nor designed and constructed to carry any load. Preliminary slope stability analyses indicate that the levees are generally stable due to the relatively flat 2:1 (H:V) side slopes and the cohesive material of which the slopes are made.

The salt pond containment levees were created by dragline or clamshell dredges and the fill placed by side casting, without compaction, and are comprised of reworked bay mud (weak clays and silts) (Moffatt and Nichol, 2005). The existing salt pond levees are generally stable because they received routine maintenance during salt operations, have gentle side slopes and are low to moderate in height (Moffatt and Nichol, 2005). Locally, where loose to medium dense sand underlies the levees, the levees could fail as the underlying sand materials liquefy during a strong earthquake (Moffat and Nichol, 2005).

---

[1] The intensity of earthquake-induced ground motions can be described using peak site accelerations, represented as a fraction of the acceleration of gravity (g).

[2] Lean clay has low to medium plasticity owing to a relatively high content of silt or sand.

[3] Fat clay is a cohesive and compressible clay of high plasticity.

Geologic Hazards

General

Geologic hazards related to landslides, seismically induced landslides and surface fault rupture are not likely in the Project area and are not discussed further. Expansive, compressible and corrosive soils, although potentially present in the Project area, are not hazards to the proposed dredging of the slough as no permanent structures are planned; these hazards are not discussed. Soil erosion, particularly during dredging of the slough, is a geologic hazard for the proposed project. Levee stability during and after dredging is also a potential hazard. Levee stability is also affected by the seismic hazards of liquefaction and lateral spreading.

Soil Erosion

Soil erosion is the process of wind or water cutting away soil materials and transporting them to another area. Rates and degree of erosion vary depending on the soil material and velocity of the water, and are greatly influenced by grading or excavation. The erosion potential for soils in the Project area is low unless they are disturbed by mechanical action such as vegetation removal or dredging. Excessive soil erosion can eventually lead to damage of building foundations, roadways and embankments. Erosion is most likely on sloped areas with exposed soil, especially where man-made slopes are created by cut and fill activities. Soil erosion rates can generally be higher during construction.

Ground Shaking

The intensity of seismic shaking, or strong ground motion, during an earthquake is dependent on the distance between the Project area and the epicenter of the earthquake, the magnitude of the earthquake, and the geologic conditions underlying and surrounding the Project area. Earthquakes occurring on faults closest to the Project area would most likely generate the largest ground motion.

An earthquake is classified by the amount of energy released, which traditionally has been quantified using the Richter scale. Recently, seismologists have begun using a Moment Magnitude (M) scale because it provides a more accurate measurement of the size of major earthquakes. For earthquakes of less than M 7.0, the Moment and Richter Magnitude scales are nearly identical. For earthquake magnitudes greater than M 7.0, readings on the Moment Magnitude scale are slightly greater than a corresponding Richter Magnitude.

A review of historic earthquake activity from 1800 to 2005 indicates that fourteen earthquakes of M6.0 or greater have occurred within 50 miles of the project route (Blake 2005), including the M 8.2 1906 San Francisco earthquake and the M 7.0 Loma Prieta earthquake. Ground movement intensity during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geologic material. Areas that are underlain by bedrock tend to experience less ground shaking than those underlain by unconsolidated sediments such as bay mud and artificial fill. The composition of underlying soils in areas located relatively distant from faults can intensify ground shaking. As the majority of the Project area is located in unconsolidated estuarine and bay mud sediments, ground-shaking effects would be amplified during an earthquake.

Liquefaction and Lateral Spreading

Liquefaction is the phenomenon in which saturated granular sediments temporarily lose their shear strength during periods of earthquake-induced, strong groundshaking. The susceptibility of a site to liquefaction is a function of the depth, density, and water content of the granular sediments, and the magnitude and frequency of earthquakes in the surrounding region. Saturated, unconsolidated silts, sands, and silty sands within 50 feet of the ground surface are most susceptible to liquefaction. Liquefaction-related phenomena include lateral spreading, ground oscillation, flow failures, loss of bearing strength, subsidence, and buoyancy effects (Youd 1978). In addition, densification of the soil resulting in vertical settlement of the ground can also occur.

Due to the generally shallow water table and soil materials in the Project area, liquefaction is considered a potential hazard in most of the Project area. Historic liquefaction events have occurred in the granular artificial fill over bay mud and artificial levees near Alviso and the surrounding area (CGS 2001). Liquefaction caused by the 1906 earthquake resulted in trees sliding into the slough, ground fractures with mud and water flowing out of them, and disturbance of the railroad bed. The above ground failures occurred by lateral spreading, sand boils and settlement, respectively (CGS 2001). Settlement of the ground and hotel in Alviso was nearly 10 feet in 1906. After the 1989 Loma Prieta earthquake ground settlement was noted near the Gold Street Bridge (CGS, 2001). Based on the soil conditions, shallow groundwater, proximity to significant seismic sources and the historic evidence of liquefaction phenomena in the area, there is a high potential for liquefaction in the Project area. However, at locations where the Alviso flood control levee was constructed out of in-place clay soils, the potential for liquefaction of the levees and associated consequences such as lateral spreading are likely to be low.

Subsidence

Land subsidence has occurred in a broad area in Santa Clara Valley due to excessive groundwater withdrawals during the first half of the twentieth century. Maximum subsidence approached eight feet and affected utilities and drainage systems, including natural streams that relied on gravity flow. Subsidence of the land surface has allowed greater incursion of seawater during high tides into traditionally freshwater areas and locally impacted freshwater shallow aquifers. By 1969 reduced groundwater pumping and enhanced groundwater recharge at percolation basins in Santa Clara Valley stopped subsidence and allowed groundwater levels to partially recover. Recently, uplift of the land surface has been measured using a remote sensing technique (InSAR, Interferometric Synthetic Aperture Radar) that recorded up to 41 mm of uplift near Sunnyvale due to the recovery of groundwater levels (Schmidt and Bürgmann 2002).

3.6.3 Environmental Impacts and Mitigation

Overview

This section explains how impacts are assessed and presents the significance criteria on which impact determinations are based.

Significance Criteria

Geologic conditions were evaluated with respect to the impacts the project may have on local geology, as well as the impact that specific geologic hazards may have upon the proposed vegetation removal and dredging. The significance of these impacts was determined on the basis of CEQA statutes, guidelines and appendices, thresholds of significance developed by local agencies, government codes and ordinances. Impacts of the project on the geologic environment would be considered significant if any of the following criteria would occur:

- Trigger or accelerate erosion;
- Result in the direct or indirect destruction or disturbance of landforms or unique geologic features;
- Located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site settlement or slope instability; or
- Result in damage to nearby structures from seismically induced ground shaking, causing landslides, liquefaction, or lateral spreading.

Impacts & Mitigation

The impacts analysis in this ~~Draft~~ Final EIR evaluates five action alternatives and the required No Project alternative. The action alternatives include vegetation removal and/or dredging, as described in Chapter 2. Under the No Project alternative, the District would not take any action in the Project area and existing programs would continue. The analysis covers impacts from the construction and maintenance phases– both in the slough and at staging areas.

All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by BCDC, CSLC, the District, or SBYC by the time of commencement of construction of this Project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Table 3.6-2 lists each impact identified for the proposed alternatives, along with the significance of each impact. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (less than significant and does not require mitigation), or Class IV (beneficial). Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections.

The Project area does not contain unique landforms or geologic units. As such, such landforms and geologic units would not be disturbed or altered and no further discussion is required.

Impact GEOL-1: Accelerated erosion due to construction.

Summary - Common to all Alternatives

Vegetation and root mass removal combined with dredging shallow areas of the slough would disturb the soil and bottom sediment, loosen the surface layer, dislodge soil particles below the water surface, and remove the protective vegetation that prevents erosion by wind and water. Channel profiles would range from very gentle (10:1, horizontal to vertical) for vegetation/root mass removal, 6:1 for 8-foot deep dredging, and 3:1 for 16-foot deep dredges. Proposed dredging would not create excessively steep slopes that are prone to erosion. As stated in Section 3.2, Water and Sediment Quality, a SWPPP, covered under the general permit for stormwater discharges, would be developed and implemented. A SWPPP outlines

Table 3.6-2 Impact and Mitigation Summary

Impact	Impact Significance	Mitigation Measures
Impact GEOL-1: Accelerated erosion due to construction.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact GEOL-2: Excavation or dredging during construction could cause slope instability.	Alts. 1, 2,: Class III	--
	Alts. 3, 4: Class II	GEOL-A GEOL-B GEOL-C
	Alt. 5: Class II	GEOL-A GEOL-B GEOL-C GEOL-D
	Alt. 6: No Impact	--
Impact GEOL-3: Project or nearby structures could be damaged by seismically induced groundshaking and/or ground failure.	Alts. 1, 2: Class III	--
	Alts. 3, 4, 5: Class II	GEOL-A GEOL-B GEOL-C
	Alt. 6: No Impact	--
Note: The impacts and mitigation would be the same both with and without the SBSP Restoration Project except for Impact GEOL-1 for Alternative 6.		

the use of BMPs that would be required to protect any land areas used for staging of equipment and materials as well as access roads. BMPs may include the use of sand bags and gravel entrances to control water erosion and tracking, and limiting construction traffic to minimize erosion. In addition, as described in Section 2.3.1, protective measures (i.e., turbidity screen) would be implemented within the slough to minimize transport and redeposition of sediment downstream.

Long-term erosion of the channel would likely be reduced for Alternatives 1, 2, 3, 4, and 5, as deepening and widening of the channel would, in general, reduce the potential for erosion under normal or flood conditions. As such, this impact is considered **Less Than Significant**.

Alternative 1: Vegetation and Root Mass Removal (2.6 acres) to 4-foot depth

Vegetation and root mass removal to a depth of 4 feet planned for Alternative 1 would disturb the soil surface covering an area of 2.6 acres on the east side of the slough. Alternative 1 would not significantly deepen the slough. Dredging operations would cause erosion, temporarily cause sediment to be suspended and transported downstream, and create a bare surface of loosened soil susceptible to water erosion.

Alternative 1 would result in an impact on channel erosion during construction. This alternative would also result in accelerated erosion on land where staging, stock piling, material storage and access routes would loosen soil or remove protective vegetation. However, with the implementation of the turbidity screen around the vegetation removal area and BMPs identified in the SWPPP, construction impacts are considered **Less Than Significant**.

Alternative 2: Vegetation and Root Mass Removal (7.0 acres) to 4-foot depth

Vegetation and root mass removal to a depth of 4 feet planned for Alternative 2 would disturb the soil surface covering an area of 7.0 acres on both sides of the slough. Alternative 2 would not significantly deepen the slough. Dredging operations would cause erosion, temporarily cause sediment to be suspended and transported downstream, and create a bare surface of loosened soil susceptible to water erosion.

Alternative 2 would result in increased erosion during construction as described in Alternative 1 above. However, with the implementation of BMPs identified in the SWPPP, construction impacts are considered **Less Than Significant**.

Alternative 3: Vegetation /Root Mass Removal and Shallow Dredging (3.7 acres) to eight-foot depth

Vegetation and root mass removal combined with dredging to a depth of eight feet would disturb the soil surface covering an area of 3.7 acres. Alternative 3 would deepen the slough on the east side of the thalweg. Dredging operations would cause erosion, temporarily cause sediment to be suspended and transported downstream, and create a bare surface of loosened soil susceptible to water erosion. However, where the channel is widened and deepened the velocity of water flow would be decreased and thereby reduce the scour potential.

Construction impacts of Alternative 3 are considered **Less Than Significant** with the implementation of the turbidity screen around the vegetation removal area and BMPs identified in the SWPPP.

Alternative 4: Vegetation/Root Mass Removal and Deep Dredging (6.2 acres) to 16-foot depth

Vegetation and root mass removal combined with dredging to a depth of 16 feet would disturb the soil surface covering an area of 6.2 acres. Alternative 4 would deepen the slough on alternating sides of the thalweg (deepest part of the slough running up/downstream); on the west side north of the SBYC and on the east side south of SBYC. Dredging operations would cause erosion, temporarily cause sediment to be suspended and transported downstream, and create a bare surface of loosened soil susceptible to water erosion. However, where the channel is widened and deepened the velocity of water flow would be decreased and thereby reduce the scour potential.

Construction impacts of Alternative 4 are considered **Less Than Significant** with the implementation of the turbidity screen around the vegetation removal area and BMPs identified in the SWPPP.

Alternative 5: Vegetation/Root Mass Removal (15.3 acres) to a 4-foot depth and Dredging (9.7 acres) to a 10-foot depth

Vegetation and root mass removal on both sides of the thalweg would potentially disturb the soil surface covering an area of 15.3 acres. In addition, dredging to depths of 10 feet below the mud line would extend from the vegetation/root mass removal limit toward the levees on both sides of the slough over an area of 9.7 acres. Dredging operations would cause erosion, temporarily cause sediment to be suspended and transported downstream, and create a bare surface of loosened soil susceptible to water erosion. However, where the channel is widened and deepened the velocity of water flow would be decreased and thereby reduce the scour potential.

Construction impacts of Alternative 5 are considered **Less Than Significant** with the implementation of the turbidity screen around the vegetation removal area and BMPs identified in the SWPPP,

Alternative 6: No Project

Under the No Project Alternative no vegetation or sediment would be removed to widen or deepen the slough. Routine maintenance of the existing levees and mowing of vegetation at Gold Street Bridge and UPRR Bridge would be continued by the District.

Alternative 6 would result in no increase in erosion of the on-land areas and would not impact erosion in the slough. This is considered **No Impact.**

Impact GEOL-2: **Excavation or dredging during construction could cause slope instability.**

The salt pond levees are known to be poorly compacted and weak, whereas the flood control levee adjacent to the Alviso community, although constructed using in-place materials that are mainly lean to fat clays, is an engineered and compacted embankment. Dredging near the toe of the levees could cause instability of the levee slope and potentially reduce the overall integrity of the levee. Levee failure could lead to flooding of the community of Alviso and surrounding baylands.

In general, proposed dredging operations under Alternatives 3, 4, and 5 are not expected to affect the existing stability of the levees provided the dredge limits are at least 10 feet away from the toe of the levees. If at any location dredging occurs within 10 feet of the toe of the levee, then additional geotechnical analysis would be necessary to evaluate the effect of the dredging on slope stability at such locations.

Alternative 1: Vegetation and Root Mass Removal (2.6 acres) to 4-foot depth

Alternative 1 would remove vegetation and root mass and minor sediment to a depth of 4 feet below the mud line for a distance of about 350 feet near the levee in the vicinity of the SBYC. The removal of the root mass and minor sediments is not expected to result in slope instability. The impact is considered **Less Than Significant.**

Alternative 2: Vegetation and Root Mass Removal (7.0 acres) to four-foot depth

Alternative 2 would remove vegetation and root mass and minor sediment to a depth of 4 feet below the mud line for a distance of 150 feet and 100 feet at two locations near the levee in the vicinity of the SBYC. The removal of the root mass and minor sediments is not expected to result in slope instability. The impact is considered **Less Than Significant**.

Alternative 3: Vegetation /Root Mass Removal and Shallow Dredging (3.7 acres) to eight-foot depth

Alternative 3 would result in an impact on levee stability if dredging limits (vertical and horizontal) are not constrained. Final dredging plans and profiles shall incorporate the 10-foot limit or additional geotechnical analysis shall be conducted to determine the appropriate limit. Dredging operations shall be monitored to prevent unintended removal of levee material. The levee surface shall be monitored to identify deflection or movement of the embankment. These construction and operational impacts are considered **Less Than Significant with Mitigation.**

Alternative 3 dredging extends to depths of 8 feet below existing grade near the toe of the flood control levee for a distance of 250 feet and 350 feet near the SBYC, respectively. The impact and mitigations are discussed above. The impact is considered **Less Than Significant with Mitigation** after implementation of measures GEOL-A, GEOL-B, and GEOL-C.

- **Mitigation Measure GEOL-A: Implement dredge limits from the toe of the levees and conduct additional geotechnical review as needed.** The District shall not dredge within 10 feet of the toe of the flood control and salt pond levees and shall not dredge deeper than 16-feet as proposed in Alternative 4. If the District intends to dredge beyond these established limits, then additional geotechnical analysis shall be conducted to determine the smaller horizontal and vertical limits that maintain the levee stability. Final plans for the dredging shall incorporate the geotechnical recommendations regarding the horizontal and vertical limits of dredging. Additional geotechnical review and recommendations shall be completed by a California licensed geotechnical engineer and shall be submitted to the District during preparation of final design plans and specifications.
- **Mitigation Measure GEOL-B: Monitor and limit dredging activities.** Dredging activities shall be monitored to ensure that the planned limits are not exceeded. Field monitors shall be able to communicate with the dredge operators and have the authority to direct work to limit the advance of dredging equipment toward the levee. Field monitors may be other environmental compliance monitors (e.g., for biology and fisheries). The field monitoring shall be completed at least once per day and weekly summary reports shall be submitted to the environmental planner monitoring for CEQA compliance. Field monitors shall utilize reference points and bench marks to gauge the advance of dredging (vertical and horizontal). Monitoring may require access to water areas using boats. If dredging limits are inadvertently exceeded, all activities shall be halted and the District shall consult with a California licensed geotechnical engineer to determine necessary follow-up actions to ensure stability of the levees. If the geotechnical engineer determines that the levee is stable after follow-up examination, then no action is required. If the geotechnical engineer determines that the levee is unstable, then corrective actions shall be implemented. Corrective actions may include replacement of the material removed with lean clay or other stronger material.
- **Mitigation Measure GEOL-C: Establish benchmarks at proposed work areas.** Benchmarks shall be established at the top of the levee in the proposed work areas. Benchmarks shall be surveyed for location and elevation before, during and after construction to monitor deflection of the top of the levee. Routine survey on a weekly to bi-weekly basis shall be required during construction. Post-construction monitoring on a monthly basis shall extend through winter and spring) following the completion of dredging. The surveying and monthly reporting shall be performed by a licensed surveyor.

Alternative 4: Vegetation/Root Mass Removal and Deep Dredging (6.2 acres) to 16-foot depth

Alternative 4 dredging would extend to depths of 16 feet below existing grade near the toe of the flood control levee for a distance of 250 feet near the SBYC. Alternatives 4 would result in an impact on levee stability if dredging limits (vertical and horizontal) are not constrained. Final dredging plans and profiles shall incorporate the 10-foot limit or additional geotechnical analysis shall be conducted to determine the appropriate limit. Dredging operations shall be monitored to prevent unintended removal of levee material. The impact and mitigation are discussed above. The impact is considered **Less Than Significant with Mitigation** after implementation of GEOL-A, GEOL-B and GEOL-C.

- **Mitigation Measure GEOL-A, Implement dredge limits from the toe of the levees and conduct additional geotechnical review as needed**, applies here.

- **Mitigation Measure GEOL-B, Monitor and limit dredging activities,** applies here.
- **Mitigation Measure GEOL-C, Establish bench marks at proposed work areas,** applies here.

Alternative 5: Vegetation/Root Mass Removal (15.3 acres) to a 4-foot depth and Dredging (9.7 acres) to a 10-foot depth

The proposed dredging to depths of 10 feet below existing grade would extend to the toe of the Alviso flood control levee between the UPRR and Gold Street bridges, and continue north another 500 feet. Although a 10-foot high vertical cut is not likely at the levee toe, the horizontal and vertical limits of dredging near the toe of the levee must be applied to not adversely impact the levee embankment.

Alternative 5 would involve dredging activities near the existing UPRR railroad bridge. The impact of the dredging on the stability of the bridge abutments, especially the south abutment, would require further evaluation during design. Depending upon the as-built condition of the bridge foundations, dredging activities at that location may result in levee instability which could cause undermining of the bridge. Appropriate mitigation measures, including structural modifications to the abutment and/or foundations, or avoidance of the UPRR bridge and area north and south of the site, may be necessary to ensure levee and bridge stability. The impact is considered **Less Than Significant with Mitigation** after implementation of measures GEOL-A, GEOL-B, GEOL-C, and GEOL-D.

- **Mitigation Measure GEOL-A, Implement dredge limits from the toe of the levees and conduct additional geotechnical review as needed,** applies here.
- **Mitigation Measure GEOL-B, Monitor and limit dredging activities,** applies here.
- **Mitigation Measure GEOL-C, Establish bench marks at proposed work areas,** applies here.
- **Mitigation Measure GEOL-D, Avoid UPRR bridge abutment and/or foundation.** The District shall conduct further investigation during design of the Project to determine the as-built condition of the bridge abutment and foundations. If dredging activities would result in undermining of the bridge from unstable levees, the District shall revise the dredging plan to avoid dredging at least 25 feet on either side of the UPRR bridge (or a distance permitted by UPRR).

Alternative 6: No Project

Under the No Project Alternative no vegetation or sediment would be removed to widen or deepen the slough. Routine maintenance of the existing levees would identify slope movement or failure of the levees slope. Alternative 6 would result in **No Impact.**

Impact GEOL-3: **Project or nearby structures could be damaged by seismically induced groundshaking and/or ground failure.**

Summary - Common to all Alternatives

The geologic site conditions in the Project area are highly susceptible to the geologic hazards related to strong ground shaking and the resulting effects of liquefaction and lateral spreading. The project actions would not increase the liquefaction susceptibility of the existing natural and artificial sediments. Dredging limits that extend to the toe of the levee slope must be constrained to avoid removing any of the levee embankment required for stability. Final dredging plans shall consider the original design and construction of the levee and implement limits that avoid excavation within 10 feet of the engineered levee embankment or deeper than 16 feet. Dredging near the Pond A8 levee would have similar impacts to the much weaker embankment fill. However, failure of the salt pond levees due to lateral spreading or liquefaction would not impact the structures or residents of Alviso but may partly impact boat navigation in the slough.

Alternative 1: Vegetation and Root Mass Removal (2.6 acres) to four-foot depth

Alternative 1 would remove vegetation and root mass and minor sediment to a depth of 4 feet below the mud line for a distance of about 350 feet near the levee in the vicinity of the SBYC. The nominal increase in slope inclination resulting from the dredging would not significantly alter the susceptibility of the levees to the secondary impacts of ground shaking such as lateral spreading and liquefaction. The impact is considered **Less Than Significant**.

Alternative 2: Vegetation and Root Mass Removal (7.0 acres) to four-foot depth

Alternative 2 would remove vegetation and root mass and minor sediment to a depth of 4 feet below the mud line for a distance of 150 feet and 100 feet at two locations near the levee in the vicinity of the SBYC. The minor increase in slope inclination would not significantly alter the susceptibility of the levees to secondary impacts caused by strong ground shaking. The impact is considered **Less Than Significant.**

Alternative 3: Vegetation /Root Mass Removal and Shallow Dredging (3.7 acres) to eight-foot depth

Alternative 3 dredging extends to depths of 8 feet near the toe of the flood control levee for a distance of 250 feet and 350 feet south and north of the SBYC, respectively. The impact and mitigation are discussed above. Limiting the vertical and horizontal dredge limits would not undercut the levee toe,, significantly steepen the slopes, nor increase the risk of secondary affects of strong groundshaking. The impact is considered **Less Than Significant with Mitigation** after implementation of measures GEOL-A, GEOL-B, and GEOL-C.

- **Mitigation Measure GEOL-A, Implement dredge limits from the toe of the levees and conduct additional geotechnical review as needed,** applies here.
- **Mitigation Measure GEOL-B, Monitor and limit dredging activities,** applies here.
- **Mitigation Measure GEOL-C, Establish bench marks at proposed work areas,** applies here.

Alternative 4: Vegetation/Root Mass Removal and Deep Dredging (6.2 acres) to 16-foot depth

Alternative 4 dredging extends to depths of 16 feet near the toe of the flood control levee for a distance of 250 feet near the SBYC. Limiting the horizontal dredge boundary to no closer than 10 feet of the existing levee toe and not exceeding the 3:1 slope created by dredging would prevent undercutting of the levee and not increase the risk of secondary affects due to strong groundshaking. The impact and mitigation are discussed above. The impact is considered **Less Than Significant** after implementation of measures GEOL-A, GEOL-B, and GEOL-C.

- **Mitigation Measure GEOL-A, Implement dredge limits from the toe of the levees and conduct additional geotechnical review as needed,** applies here.
- **Mitigation Measure GEOL-B, Monitor and limit dredging activities,** applies here.
- **Mitigation Measure GEOL-C, Establish bench marks at proposed work areas,** applies here.

Alternative 5: Vegetation/Root Mass Removal (15.3 acres) to a 4-foot depth and Dredging (9.7 acres) to a 10-foot depth

The proposed dredging to depths of 10 feet below the mud line would extend to the toe of the Alviso flood control levee between the UPRR and Gold Street bridges, and continues north another 500 feet. Although a 10-foot high vertical cut is not likely at the levee toe, the horizontal and vertical limits of dredging near the toe of the levee should be reduced to not adversely impact the levee embankment.

Alternatives 3, 4, and 5 would result in an impact on levee stability if dredging limits (vertical and horizontal) are not constrained. Dredging operations shall be monitored to prevent unintended removal of levee material. Limiting the horizontal dredge boundary to no closer than 10 feet of the existing levee toe and limiting the dredged side slopes to 3:1 or less would prevent undercutting of the levee and ensure that the risk of secondary effects of strong groundshaking would not increase. These construction and operational impacts are considered **Less Than Significant with Mitigation** after implementation of measures GEOL-B, GEOL-C, and GEOL-D.

- **Mitigation Measure GEOL-A, Implement dredge limits from the toe of the levees and conduct additional geotechnical review as needed,** applies here.
- **Mitigation Measure GEOL-B, Monitor and limit dredging activities from the toe of the levees and conduct additional geotechnical review as needed,** applies here.
- **Mitigation Measure GEOL-C, Establish bench marks at proposed work areas,** applies here

Alternative 6: No Project

Under the No Project Alternative no vegetation or sediment would be removed to widen or deepen the slough. Alternative 6 would result in **No Impact.**

3.6.4 Relationship to South Bay Salt Ponds Phase 1 Action at Pond A8

If the SBSP Phase 1 Action is implemented and successful over the long term, tidal scour in Alviso Slough would likely increase the current channel width by 50 to 90 feet in the vicinity of the SBYC, and deepen the channel bottom. These changes would be self-sustaining as long as tidal exchange between Pond A8 and Alviso Slough continued. The impacts identified above would be the same with or without the Pond 1 Action at Pond A8 for Alternatives 1 through 5. For Alternative 6, scour of the channel bottom would temporarily increase erosion for Impact GEOL-1.

3.6.5 Sediment Disposal Options

Sediment disposal options include trucking, barging, or conveying (e.g., slurry pipeline) the dredged sediment to a location where it could be re-used, rather than trucking the material to the Newby Island Landfill, as described in Chapter 2. Disposal options other than trucking would result in similar impacts as considered above, and would require the same mitigation measures, and possible additional measures, to cover impacts associated with construction of a slurry pipeline on tops of levees.

This page intentionally left blank.

3.7 HAZARDS AND HAZARDOUS MATERIALS (HAZMAT)

Hazardous materials are substances with certain physical and chemical properties that could pose a substantial present and future hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed. The categories that apply to hazardous materials are toxicity, ignitability, corrosivity, or reactivity.

3.7.1 Regulatory Setting

Numerous local, State and Federal laws and regulations regulate the use, storage, and disposal of hazardous materials, including management of contaminated soils and groundwater. The U.S. EPA is the Federal agency that administers hazardous materials and waste regulations. State agencies include the California EPA (Cal/EPA), which includes DTSC, the San Francisco Bay RWQCB, the California Air Resources Board (CARB), and other offices. Local regulatory agencies include the Santa Clara County Department of Environmental Health. A description of agency jurisdiction and involvement in management of hazardous materials is provided below.

Table 3.7-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
FEDERAL	
U.S. EPA *RCRA, CERCLA, SARA*	The U.S. EPA is the Federal agency responsible for enforcement and implementation of Federal laws and regulations pertaining to hazardous materials. The legislation includes the Resource Conservation and Recovery Act of 1986 (RCRA), the Superfund Amendments and Reauthorization Acts of 1986 (SARA), and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The Federal regulations are primarily codified in Title 40 of the Code of Federal Regulations (40 CFR). The U.S. EPA provides oversight and supervision for site investigations and remediation projects, and has developed land disposal restrictions and treatment standards for the disposal of certain hazardous wastes.
STATE	
Department of Toxic Substances Control *Hazardous Waste Control Act and the Hazardous Substance Account Act*	The DTSC works in conjunction with the U.S. EPA to enforce and implement specific laws and regulations pertaining to hazardous wastes. The California legislation, for which DTSC has primary enforcement authority, includes the Hazardous Waste Control Act and the Hazardous Substance Account Act. Most State hazardous waste regulations are contained in Title 22 of the California Code of Regulations (CCR). The DTSC generally acts as the lead agency for soil and groundwater clean up projects, and establishes clean up and action levels for subsurface contamination that are equal to, or more restrictive than, Federal levels.
California Air Resources Board *Clean Air Act*	The CARB has responsibility for developing and enforcing regulations to achieve and maintain State and Federal ambient air quality standards in the district. CARB is responsible for enforcing the Clean Air Act and California's State Ambient Air Quality Standards.

Table 3.7-1 Applicable Plans and Policies	
Agency + Plan or Policy	**Overview & Applicability**
San Francisco Bay Regional Water Quality Control Board *California Porter-Cologne Water Quality Act of 1969*	The study area is located in the jurisdiction of the San Francisco Bay RWQCB. The RWQCB is authorized by the California Porter-Cologne Water Quality Act of 1969 to implement water quality protection laws. The RWQCB provides oversight for sites where the quality of groundwater or surface waters is threatened, and has the authority to require investigations and remedial actions.
California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) *Title 8, CCR*	Worker health and safety is regulated at the Federal level by the Federal Department of Industrial Relations. Worker health and safety in California is regulated by the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA). California standards for workers dealing with hazardous materials are contained in Title 8, CCR, and include practices for all industries (General Industry Safety Orders), and specific practices for construction and hazardous waste operations and emergency response. Cal/OSHA conducts on-site evaluations and issues notices of violation to enforce necessary improvements to health and safety practices.
LOCAL	
Santa Clara County Department of Environmental Health *Hazardous Materials Storage Ordinance, Local Oversight Program*	The County Department of Environmental Health's Hazardous Materials Compliance Division is a Certified Unified Program Agency (CUPA) responsible for enforcing specified State laws and regulations governing the management of hazardous materials and wastes and overseeing the activities of Participating Agencies (PA) within the County's Unified Program. The local oversight program (i.e., leaking underground storage tank cleanup program) addresses the protection of the County of Santa Clara's water resources, specifically groundwater basins, through the prevention of adverse environmental factors, preservation and improvement of beneficial environmental factors that affect our community's health and safety and the minimization of the economic costs to the general public and business community of our County.
City of San Jose Department of Planning, Building & Code Enforcement *Code Enforcement Division*	The Code Enforcement Division enforces City regulations related to an existing structure that constitute a clear and present danger to the public, hazardous weeds, graffiti, signs, illegal dumping, and water waste.

3.7.2 Physical Setting

The Project site consists of the wetlands and open water channel of the Alviso Slough. As such, it is devoid of land uses that currently involve the storage or use of hazardous materials. A Phase I Hazardous Substance Liability Assessment was conducted for the Project site by Earth Tech (2006) on behalf of the District to determine if any potentially hazardous materials and/or recognized environmental conditions (RECs) are located on the Project site. The study includes an extensive review of state and federal databases and historical aerial photographs.

The SBYC is identified as an RCE (EarthTech 2006). The SBYC has a history of at least two environmental releases into Alviso Slough from Yacht Club boats:

- SBYC boat release of diesel fuel and oil in 2002; and
- SBYC boat release of raw sewage and oil in 2004.

Six other sites are identified as potential sources or hazardous materials that do not meet the American Society of Testing and Materials (ASTM) definition of an REC, but considered to be potential RECs (EarthTech 2006). The six sites are identified here with additional detail following:

- Path leading from the District flood control levee, onto the Project site for approximately 200 feet, and back to the levee;
- Former Bayside Cannery located on the eastern (opposite) side of the District flood control levee from the Project site;
- District's overflow weir to Pond A8 on the western bank portion of the Project site;
- Marshland Disposal Facility;
- South Bay Asbestos Area (SBAA); and
- Sediment deposits in Alviso Slough.

According to the 2006 EarthTech report, the path leading from the District flood control levee were observed to have serpentine gravel (which can contain asbestos) in the soil of the path. In addition, historical aerial photographs indicate the presence of industrial operations and several ASTs in the area enclosed by the path. The former Bayside Cannery is cross-gradient from the Project site but the former industrial operations may have the potential to have affected soil and/or groundwater conditions on the Project site. The Pond A8 overflow weir area has been shown through soil analytical testing during weir construction to contain hazardous materials, including metals, pesticides, and petroleum hydrocarbons (EarthTech 2006).[1] The Marshland Disposal Facility is located upgradient of the Project site and is a potential source of imported fill that may have been used in the Project site or areas adjacent to the site.

Of particular note is that the Project site is partially located in the regional SBAA (EarthTech 2006). The SBAA is approximately 550 acres in size and encompasses much of the community of Alviso. It also includes the Santos Landfill and the Highway 237 Landfill (also known as the Marshland Landfill), and Sainte Claire Corporation landfills that received asbestos wastes from 1953 to 1982 (Kleinfelder 2006). Between 1986 and 1993, the EPA paved areas where asbestos-contaminated surface soils in truck and industrial yards, wet-swept Alviso streets on a monthly basis, removed asbestos debris, installed landfill covers, implemented deed restrictions, and maintained and monitored the SBAA (Kleinfelder 2006). Their 1994 ambient air study of asbestos to assess the effectiveness of these clean-up efforts showed that there was no significant adverse health threat to the residents of Alviso due to asbestos fibers in the air (Kleinfelder 2006).

Finally, sediment deposits in Alviso Slough that have been introduced in the past have the potential to be impacted by mercury-containing sediments, which may have originated due to the gradual erosion of soils from upstream mercury-mining areas in Santa Clara County (this is addressed in Section 3.2, Water and Sediment Quality).

---

[1] Petroleum hydrocarbons include diesel, motor oil, and gasoline.

3.7.3 Environmental Impacts and Mitigation

Overview

This section describes environmental impacts and mitigation measures related to hazards and hazardous materials, including the criteria used to determine the significant of impacts.

Significance Criteria

In accordance with Appendix G of the CEQA Guidelines a significant impact related to hazardous materials would occur if the Project would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handles hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school; or
- Impair implementation of or physically interferes with an adopted emergency response plan or emergency evacuation plan.

Impacts & Mitigation

The impacts analysis in this ~~Draft~~ Final EIR evaluates five action alternatives and the required No Project alternative. The action alternatives include vegetation removal and/or dredging, as described in Chapter 2. Under the No Project alternative, the District would not take any action in the Project area and existing programs would continue. The analysis covers impacts from the construction and maintenance phases–both in the slough and at staging areas.

All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by BCDC, CSLC, the District, or SBYC by the time of commencement of construction of this Project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Table 3.7-2 lists each impact identified for the proposed alternatives, along with the significance of each impact. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (less than significant and does not require mitigation), or Class IV (beneficial). Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections.

Table 3.7-2 Impact and Mitigation Summary

Impact	Impact Significance	Mitigation Measures
Impact HAZMAT-1: Inadvertent release of hazardous materials during construction activities.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact HAZMAT-2: Potential to mobilize, transport, and deposit asbestos, hydrocarbon-contaminated sediments, and/or mercury.	Alts. 1-5: Class II	HAZMAT-A HAZMAT-B WQ-A WQ-B
	Alt. 6: No Impact	--
Note: The impacts and mitigation would be the same both with and without the SBSP Restoration Project.		

The Project is not located within one-quarter mile of an existing or proposed school (George Mayne Elementary is over 0.5 mile away), in the vicinity of a private airstrip, or within two miles of a public airport (Norman Y. Mineta San Jose International Airport is over five miles away). As such, health and safety impacts on school children, and people residing or working in the study area would not occur. The Project is not located on a site included on a list of hazardous materials sites, nor would it impair implementation of or interfere with any adopted emergency response plans or emergency evacuation plans. No further impacts discussion is required for these criteria.

Impact HAZMAT-1: **Inadvertent release of hazardous materials during construction activities.**

Summary - Common to all Alternatives

Construction activities may involve the use of certain hazardous materials (fuels, lubricants, antifreeze, etc.) for operation of machinery and haul trucks, fueling, and minor maintenance of equipment. The onsite storage and/or use of large amounts of these materials would not be required at the construction site as these materials would be brought on site only as needed throughout the construction phase. Inadvertent release through improper handling or storage, or through unforeseen and accidental conditions of these materials could result in adverse impacts to soil, surface water, and/or groundwater. Potential health risks from diesel and other oils and grease leaking into groundwater aquifers or to surface waters is remote, and further reduced given the required compliance with the District's BMP (#HM10 – HM14)[2] which limit fueling and equipment servicing to locations outside of waterways, ensure proper handling and storage of hazardous materials, and ensure proper spill prevention training and clean-up equipment on site.

Alternatives 1, 2, 3, 4, and 5:

Alternatives 1 through 5 would use mechanized construction equipment in and around Alviso Slough and the staging areas. The larger actions (Alternatives 3, 4, and 5) would utilize more equipment and for a longer period of time than the smaller actions (Alternatives 1 and 2) and thus the likelihood of an accidental spill or release could be incrementally larger. However, the impact to water quality would be the same.

---

[2] HM-10: Vehicle and Equipment Fueling; HM-11: Vehicle and Equipment Maintenance; HM-12: Hazardous Materials Management; and HM-13: Spill Prevention; and HM-14: Spill Kit Location.

Alternatives 1 through 5 could result in a spill or release of hazardous materials through improper handling or storage, or through unforeseen and accidental conditions. However, with the development and implementation of a hazardous materials management/fuel spill containment plan, which is a regulatory requirement, this impact is considered **Less Than Significant**.

A hazardous materials management/fuel spill containment plan is developed and implemented by the construction contractor and given to all contractors and biological monitors working on the Project, with at least one copy of the plan located onsite at all times. The purpose of the plan is to provide onsite construction managers, environmental compliance monitors, and regulatory agencies with a detailed description of hazardous materials management, spill prevention, and spill response/cleanup measures associated with the construction of Project elements. The primary objective of the plan is to prevent a spill of hazardous materials. Elements of the plan include, but are not limited to, the following:

- A discussion of hazardous materials management, including delineation of hazardous material and hazardous waste storage areas, access and egress routes, waterways, emergency assembly areas, and temporary hazardous waste storage areas
- Materials Safety Data Sheets for all chemicals used and stored on site
- An inventory list of emergency equipment
- Spill control and countermeasures including employee spill prevention/response training
- Notification and documentation procedures
- Monthly reporting plan

Alternative 6: No Project

Alternative 6 would not result in vegetation and root mass removal or dredging in the Project area. Alternative 6 therefore could not result in a spill or release of hazardous materials through improper handling or storage, or through unforeseen and accidental conditions. This is considered **No Impact**.

Impact HAZMAT-2: **Potential to mobilize, transport, and deposit asbestos, hydrocarbon-contaminated sediments, and/or mercury.**

The following discussion addresses potential mobilization of asbestos and hydrocarbon-contaminated sediments. The following also discusses the potential hazard associated with removal and disposal of mercury-contaminated sediments. Potential impacts associated with the mobilization, transport, and deposit of mercury-contaminated sediments are discussed in Impact WQ-2 in Section 3.2, Water and Sediment Quality and Section 3.8, Air Quality.

Summary - Common to all Alternatives

Construction activities would also include vegetation/root mass removal and/or dredging. This would disturb the sediment in the slough that may contain hazardous substances (i.e. petroleum hydrocarbons and asbestos). Therefore, exposure of asbestos and/or hydrocarbon-contaminated sediments could occur. It is expected that the potential for mobilization and transport of contaminated sediments would increase in proportion to the area of vegetation removal and dredging.

As described in Section 3.7.2, the Project site either contains or is in the vicinity of sites of concern that may contain hazardous materials. Although remediation of asbestos-affected areas of the NPL site has taken place, the NPL site remains open and there is a potential for residual asbestos-impacted soils and/or groundwater on the Project site (EarthTech 2006). Sediment deposits in Alviso Slough that have been introduced in the past have the potential to be impacted by mercury-containing sediments, which may have originated due to the gradual erosion of soils from upstream mercury-mining areas in Santa Clara County. Impacts and mitigation related to mercury-containing sediments are discussed in Section 3.2. The mitigation for all action alternatives is to conduct soil testing for asbestos and petroleum hydrocarbons prior to project construction activities. If testing results show the presence of asbestos and/or petroleum hydrocarbons, appropriate soil disposal requirements shall be followed.

Dredging activities would involve the excavation, removal and temporary storage of potential mercury-contaminated sediments prior to disposal. Without proper handling, these potentially contaminated sediments could pose a hazard to the environment and people.

Excavation activities associated with the lowering of the weir and flood protection improvements (e.g., grading) as proposed in Mitigation Measures HYD-A and HYD-E, respectively (see Section 3.1, Hydrology and Geomorphology), would result in disturbance to the sediment as described for Project construction activities above. The same potential for mobilization and transport of contaminated sediments would occur.

Alternatives 1, 2, 3, 4, and 5

Alternatives 1 through 5 could result in exposure of potentially contaminated sediments (asbestos and/or petroleum hydrocarbons) in the Project area. Alternatives 1 through 5 would all include the removal of the abandoned vessels at SBYC. As described in Section 3.7.2, the SBYC has a history of at least two environmental releases into Alviso Slough from the Yacht Club boats. The reports from these site reports indicate the presence of historical releases of petroleum hydrocarbons on the site (EarthTech 2006).

The extent of potential hazardous materials in the Project area is not known. However, due to the potential presence of asbestos and/or petroleum hydrocarbons in the Project area based on sites identified in the Phase I report, the likelihood to mobilize, transport, and deposit contaminated sediment is considered potentially significant. However, this impact is considered **Less than Significant with Mitigation** after implementation of HAZMAT-A, ~~and~~ HAZMAT-B, WQ-A and WQ-B (See Section 3.2.3 for a detailed description of WQ-A and WQ-B).

- **Mitigation Measure HAZMAT-A: Conduct Soil Testing for Asbestos and Petroleum Hydrocarbons Prior to Sediment Disturbing Activities and Remove Contaminated Soils as Needed.** The District or construction contractor shall conduct soil testing for asbestos and petroleum hydrocarbons in the areas proposed for vegetation/root mass removal, dredging, lowering of the weir, and other flood protection improvement activities. Testing for asbestos shall meet EPA Standard Method "ASBESTOS" focusing on areas of apparent fill (including path observed to contain construction debris and suspected serpentine-containing gravel, as well as the areas close to the Pond A8 overflow weir, where fill was discovered). Petroleum hydrocarbon testing methods shall meet EPA 8015M and EPA 8260B standards. If testing results show the presence of unacceptable levels of asbestos and/or petroleum hydrocarbons, the District or its construction contractor shall remove and dispose the contaminated soil and vegetation according to the regulatory agencies' requirements.

- **Mitigation Measure HAZMAT-B: Test sediment in the construction area to determine mercury concentrations in surficial sediments exposed by dredging and vegetation removal.** The District or construction contractor shall conduct soil testing for mercury in the areas proposed for vegetation/root mass removal, dredging, lowering of the weir, and other flood protection improvement activities. Soil and sediments shall be analyzed to ensure that potentially contaminated materials (e.g., soils containing elevated mercury concentrations) are handled, transported, and disposed of in accordance with applicable regulatory agencies' requirements.

Alternative 6: No Project

Alternative 6 would not result in vegetation and root mass removal or dredging in the Project area. Alternative 6 therefore could not result in the mobilization, transport, and deposit of asbestos and/or hydrocarbon-contaminated. This is considered **No Impact**.

3.7.4 Relationship to South Bay Salt Ponds Phase 1 Action at Pond A8

The impacts identified above would be the same with or without the Phase 1 Action at Pond A8.

3.7.5 Sediment Disposal Options

Sediment disposal options include trucking, barging, or conveying (e.g., slurry pipeline) the dredged sediment to a location where it could be re-used, rather than trucking the material to the Newby Island Landfill, as described in Chapter 2. These disposal options would result in similar impacts as considered above and would require the same mitigation measure.

3.8 AIR QUALITY (AIR)

This section includes a summary of applicable regulations and existing air quality conditions, and an analysis of potential short-term, and long-term air quality impacts of the proposed project. The method of analysis for short-term construction, long-term regional, local mobile source, odor, and toxic air contaminant (TAC) emissions is based on the recommendations of the Bay Area Air Quality Management District (BAAQMD 1999).

3.8.1 Regulatory Setting

Air quality within the Project area is regulated by the U.S EPA, CARB, and the BAAQMD. Each of these agencies develops rules, regulations, policies, plans and/or goals to comply with applicable legislation (Refer to Table 3.8-1). Although U.S. EPA regulations may not be superseded, both state and local regulations may be more stringent.

Table 3.8-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
FEDERAL	
U.S. EPA *Clean Air Act (CAA)*	At the federal level, U.S. EPA has been charged with implementing national air quality programs. U.S. EPA's air quality mandates are drawn primarily from the CAA, which was enacted in 1970. The most recent major amendments made by Congress were in 1990. The CAA required the U.S. EPA to establish national ambient air quality standards (NAAQS). As shown in Table 3.8-4, EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable and fine particulate matter (PM_{10} and $PM_{2.5}$, respectively), and lead. The primary standards protect the public health and the secondary standards protect public welfare. The CAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. U.S. EPA has programs for identifying and regulating hazardous air pollutants (HAPs). Title III of the CAAA directed EPA to promulgate national emissions standards for HAPs (NESHAP). The NESHAP may differ for major sources than for area sources of HAPs. Major sources are defined as stationary sources with potential to emit more than 10 tons per year (TPY) of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources. The emissions standards are to be promulgated in two phases. In the first phase (1992–2000), EPA developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring MACT. For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), EPA is required to promulgate health risk–based emissions standards where deemed necessary to address risks remaining after

Table 3.8-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
	implementation of the technology-based NESHAP standards. The CAA also required EPA to issue vehicle or fuel standards containing reasonable requirements that control toxic emissions, at a minimum to benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 required the use of reformulated gasoline in selected areas with the most severe ozone nonattainment conditions to further reduce mobile-source emissions. The U.S. Supreme Court ruled on April 2, 2007 that carbon dioxide (CO_2) is an air pollutant as defined under the CAA, and that EPA has the authority to regulate greenhouse gases (GHG) emissions (Massachusetts v. U.S. Environmental Protection Agency [2007] 549 U.S. 05-1120). However, there are no federal regulations or policies regarding GHG emissions applicable to the proposed project at the time of writing. General conformity applies in both federal nonattainment and maintenance areas. Within these areas, it applies to any federal action not specifically exempted by the Federal Clean Air Act (CAA) or U.S. EPA regulations. Emissions from construction activities are also included. General conformity does not apply to projects or actions that are covered by the transportation conformity rule. If a federal action falls under the general conformity rule, the federal agency responsible for the action is responsible for making the conformity determination. The proposed project would require federal permitting prior to project implementation. Applicability of general conformity to the proposed project will be determined before the record of decision is signed.
STATE	
California Air Resources Board (CARB) *California Clean Air Act (CCAA)*	CARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the CCAA. The CCAA, adopted in 1988, required CARB to establish California ambient air quality standards (CAAQS) (Table 3.8-4). In most cases the CAAQS are more stringent than the National standards. Differences in the standards are generally explained by the health effects studies considered during the standard setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals. The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that local air districts should focus particular attention on reducing the emissions from transportation and area-wide emission sources, and provides districts with the authority to regulate indirect sources. Other CARB responsibilities include, but are not limited to, overseeing local air district compliance with California and federal laws, approving local air quality plans, submitting SIPs to EPA, monitoring air quality, determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels

Table 3.8-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
CARB *Toxic Air Contaminant (TAC) Program*	TACs in California are primarily regulated through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). AB 1807 sets forth a formal procedure for CARB to designate substances as TACs. This includes research, public participation, and scientific peer review before CARB can designate a substance as a TAC. To date, CARB has identified over 21 TACs, and adopted EPA's list of HAPs as TACs. Most recently, diesel PM was added to the CARB list of TACs. CARB also published the Air Quality and Land Use Handbook: A Community Health Perspective, which provides guidance concerning land use compatibility with TAC sources (California Air Resources Board 2005). While not a law or adopted policy, the handbook offers advisory recommendations for the siting of sensitive receptors near uses associated with TACs such as freeways and high-traffic roads, commercial distribution centers, rail yards, ports, refineries dry cleaners, gasoline stations, and industrial facilities to help keep children and other sensitive populations out of harm's way.
California Environmental Protection Agency (CalEPA) *Greenhouse Gas Emissions (GHG)*	**Executive Order S-3-05** Executive Order S-3-05, which was signed by Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. To combat those concerns, the Executive Order established total GHG emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050. The Executive Order directed the Secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. **Assembly Bill 32, the California Climate Solutions Act of 2006** In September 2006, Governor Arnold Schwarzenegger signed Assembly Bill (AB) 32, the California Climate Solutions Act of 2006. (See Stats. 2006, ch. 488, enacting Health & Safety Code, §§ 38500 – 38599.) AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32. AB 32 does not explicitly apply to emissions from construction activity, though emissions associated with heavy duty equipment are closely connected to the energy sector through combustion of fossil fuels. Further, because AB 32 imposes a statewide emissions cap, construction-related emissions will ultimately factor in to considerations of GHG emissions in the state.

Table 3.8-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
	Senate Bill 97 Senate Bill (SB) 97, signed August 2007, acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. (Stats. 2007, ch. 185 (enacting Pub. Resources Code, §§ 21083.05 and 21097.) This bill directs the State Office of Planning and Research (OPR) to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA by July 1, 2009. The Resources Agency is required to certify and adopt those guidelines by January 1, 2010. This bill also removes, both retroactively and prospectively, as legitimate litigation causes of action any claim of inadequate CEQA analysis of effects of GHG emissions associated with environmental review for projects funded by the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006, or the Disaster Preparedness and Flood Protection Bond Act of 2006 (Proposition 1B or 1E). This provision will be repealed by operation of law on January 1, 2010, at which time such projects, if any remain unapproved, will no longer enjoy the protection against litigation claims based on failure to adequately address climate change issues. This bill would only protect a handful of public agencies from CEQA challenges on certain types of projects for a few years time.
LOCAL	
BAAQMD *CEQA Guidelines*	BAAQMD attains and maintains air quality conditions in Santa Clara County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of the BAAQMD includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. BAAQMD also inspects stationary sources of air pollution and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the CAA, CAAA, and the CCAA. In 1999, BAAQMD released the BAAQMD CEQA Guidelines (BAAQMD 1999). This is an advisory document that provides lead agencies, consultants, and project applicants with uniform procedures for addressing air quality in environmental documents. The handbook contains the following applicable components: – Criteria and thresholds for determining whether a project may have a significant adverse air quality impact; – Specific procedures and modeling protocols for quantifying and analyzing air quality impacts; – Methods available to mitigate air quality impacts; and – Information for use in air quality assessments and environmental documents that will be updated more frequently such as air quality data, regulatory setting, climate, and topography.

Table 3.8-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
BAAQMD *Air Quality Plans*	As stated above, BAAQMD prepares plans to attain ambient air quality standards in the SFBAAB. BAAQMD prepares ozone attainment plans (OAP) for the national ozone standard and Clean Air Plans (CAP) for the California standard both in coordination with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG). Past plans include the 2001 OAP and the 2000 CAP. BAAQMD has begun a process to update the Bay Area Ozone Strategy (BAOS), in cooperation with MTC and the Association of Bay Area Governments (ABAG). The BAOQ will review the region's progress in reducing ozone levels to attain State one-hour and eight-hour ozone standards, describe current conditions, and chart a course for future actions to further reduce ozone levels in the Bay Area.
BAAQMD *Rule 7*	Under BAAQMD Rule 2-1 (General Permit Requirements), Rule 2-2 (New Source Review), and Rule 2-5 (New Source Review of Toxic Air Contaminants) all sources that possess the potential to emit TACs are required to obtain permits from the district. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including new-source review standards and air toxics control measures. BAAQMD limits emissions and public exposure to TACs through a number of programs. BAAQMD prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors.
BAAQMD *Rules 2-1, 2-2, and 2-5*	Because offensive odors rarely cause any physical harm, neither the state nor the federal government has adopted any rules or regulations related to odor emissions. However, BAAQMD has adopted Rule 7 (Odorous Substances) that specifically addresses citizen complaints. As described by the rule, the limitations of this Regulation shall not be applicable until odor complaints from ten or more complainants within a 90-day period are received, alleging that a person has caused odors perceived at or beyond the property line of such person and deemed to be objectionable by the complainants in the normal course of their work, travel or residence. When the limits of this regulation become effective as a result of citizen complaints described above, the limits shall remain effective until such time as no citizen complaints have been received by the Air Pollution Control Officer (APCO) for one year. The limits of this Regulation shall become applicable again when the APCO receives odor complaints from five or more complainants within a 90-day period.
BAAQMD *Program*	BAAQMD has established a climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the Bay Area. Measures to promote energy efficiency, reduce vehicle miles traveled, and develop alternative sources of energy can reduce emissions of greenhouse gases and also reduce air pollutants affecting the health of Bay Area residents. BAAQMD seeks to support current climate protection programs in the region and stimulate additional efforts through public education and outreach, technical assistance to local governments and other interested parties, and through promotion of collaborative efforts among stakeholders (BAAQMD 2007).

3.8.2 Physical Setting

Regional

The Alviso Slough Restoration Project area is located in the South Bay (i.e., Santa Clara County), within the San Francisco Bay Area Air Basin (SFBAAB). The SFBAAB also comprises all of Contra Costa, Marin, Napa, and San Francisco counties, and the southeast portion of Sonoma County and the southwest portion of Solano County. The ambient concentrations of air pollutant emissions in the SFBAAB are determined by the amount of emissions released by pollutant sources and the atmosphere's ability to transport and dilute such emissions. Natural factors which affect transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources, as discussed below.

Topography, Meteorology, and Climate

The SFBAAB covers an area of approximately 5,540 square miles and is characterized by complex terrain consisting of coastal mountain ranges, inland valleys, and San Francisco Bay. The SFBAAB is generally bounded on the west by the Pacific Ocean, on the north by the Coast Ranges, and on the east and south by the Diablo Range.

The climate is dominated by the strength and location of a semi-permanent, subtropical high-pressure cell over the northeastern Pacific Ocean. Climate is also affected by the moderating effects of the adjacent oceanic heat reservoir. Mild summers and winters, moderate rainfall, daytime onshore breezes, and moderate humidity characterize regional climatic conditions. In the summer, when the high-pressure cell is strongest and farthest north, fog forms in the morning and temperatures are mild. In winter, when the high-pressure cell is weakest and farthest south, occasional rainstorms occur.

Regional flow patterns affect air quality patterns by directing pollutants downwind of sources. Localized meteorological conditions, such as moderate winds, disperse pollutants and reduce pollutant concentrations. When a warm layer of air traps cooler air close to the ground, an inversion layer is produced. Such temperature inversions hamper dispersion by creating a ceiling over the area and trapping air pollutants near the ground. During summer mornings and afternoons, these inversions are present in the Alviso Slough Restoration Project area. During summer's longer daylight hours, plentiful sunshine provides the energy needed to fuel photochemical reactions between nitrogen oxides (NO_X) and reactive organic gases (ROG), which result in ozone formation.

In the winter, temperature inversions dominate during the night and early morning hours but frequently dissipate by afternoon. At this time, the greatest pollution problems are from carbon monoxide (CO) and NO_X. High CO concentrations occur on winter days with strong surface inversions and light winds. CO transport is extremely limited.

Criteria Air Pollutants

Concentrations of the following air pollutants: ozone, CO, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable and fine particulate matter (PM_{10} and $PM_{2.5}$), and lead are used as indicators of ambient air quality conditions. Because these are the most prevalent air pollutants known to be deleterious to human health and extensive health-effects criteria documents are available, they are commonly referred to as "criteria air pollutants."

A brief description of each criteria air pollutant including source types and health effects is provided below along with the most current attainment designations and monitoring data for the Alviso Slough Restoration Project area.

Ozone. Ozone is a photochemical oxidant, a substance whose oxygen combines chemically with another substance in the presence of sunlight, and the primary component of smog. Ozone is not directly emitted into the air, but is formed through complex chemical reactions between precursor emissions of ROG and NO_X in the presence of sunlight. ROG are volatile organic compounds that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_X are a group of gaseous compounds of nitrogen and oxygen that results from the combustion of fossil fuels.

Ozone located in the upper atmosphere (stratosphere) acts in a beneficial manner by shielding the earth from harmful ultraviolet radiation that is emitted by the sun. However, ozone located in the lower atmosphere (troposphere) is a major health and environmental concern. Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds or stagnant air coupled with bright sunlight and clear skies provide the optimum conditions for formation. As a result, summer is generally the peak ozone season. Because of the reaction time involved, peak ozone concentrations often occur downwind of the precursor emissions. Therefore, ozone is a regional pollutant that often affects large areas. In general, ozone concentrations over or near urban and rural areas reflect an interplay of emissions of ozone precursors, transport, meteorology, and atmospheric chemistry (Godish 2004).

The adverse health effects associated with exposure to ozone pertain primarily to the respiratory system. Scientific evidence indicates that ambient levels of ozone affect not only sensitive receptors, such as asthmatics and children, but healthy adults as well. Exposure to ambient levels of ozone ranging from 0.10 to 0.40 parts per million (ppm) for one to two hours has been found to substantially alter lung functions by increasing respiratory rates and pulmonary resistance, decreasing tidal volumes, and impairing respiratory mechanics. Ambient levels of ozone above 0.12 ppm are linked to symptomatic responses that include such symptoms as throat dryness, chest tightness, headache, and nausea. In addition to the above adverse health effects, evidence also exists relating ozone exposure to an increase in the permeability of respiratory epithelia; such increased permeability leads to an increase in responsiveness of the respiratory system to challenges, and the interference or inhibition of the immune system's ability to defend against infection (Godish 2004).

Carbon Monoxide. CO is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels, primarily from mobile (transportation) sources. In fact, 77 percent of the nationwide CO emissions are from mobile sources. The other 23 percent consists of CO emissions from wood-burning stoves, incinerators, and industrial sources.

CO enters the bloodstream through the lungs by combining with hemoglobin, which normally supplies oxygen to the cells. However, CO combines with hemoglobin much more readily than oxygen does, resulting in a drastic reduction in the amount of oxygen available to the cells. Adverse health effects associated with exposure to CO concentrations include such symptoms as dizziness, headaches, and fatigue. CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases (EPA 2007a).

The highest concentrations are generally associated with cold stagnant weather conditions that occur during the winter. In contrast to ozone, which tends to be a regional pollutant, CO problems tend to be localized.

Nitrogen Dioxide. NO_2 is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2 (EPA 2007a). The combined emissions of NO and NO_2 are referred to as NO_X, which are reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a particular geographical area may not be representative of the local NO_X emission sources.

Inhalation is the most common route of exposure to NO_2. Because NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects depends primarily on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, including coughing, difficulty with breathing, vomiting, headache, and eye irritation during or shortly after exposure. After a period of approximately four to 12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe, symptomatic NO_2 intoxication after acute exposure has been linked on occasion with prolonged respiratory impairment with such symptoms as chronic bronchitis and decreased lung functions.

Sulfur Dioxide. SO_2 is produced by such stationary sources as coal and oil combustion, steel mills, refineries, pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. SO_2 is a respiratory irritant with constriction of the bronchioles occurring with inhalation of SO_2 at five ppm or more. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis.

Particulate Matter. Respirable particulate matter with an aerodynamic diameter of 10 micrometers or less is referred to as PM_{10}. PM_{10} consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires and natural windblown dust, and particulate matter formed in the atmosphere by condensation and/or transformation of SO_2 and ROG (EPA 2007a). Fine particulate matter ($PM_{2.5}$) includes a subgroup of smaller particles that have an aerodynamic diameter of 2.5 micrometers or less (CARB 2006).

The adverse health effects associated with PM_{10} depend on the specific composition of the particulate matter. For example, health effects may be associated with metals, polycyclic aromatic hydrocarbons (PAH), and other toxic substances adsorbed onto fine particulate matter, which is referred to as the piggybacking effect, or with fine dust particles of silica or asbestos. Generally, adverse health effects associated with PM_{10} may result from both short-term and long-term exposure to elevated concentrations and may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations to the immune system, carcinogenesis, and premature death (EPA 2007a). $PM_{2.5}$ poses an increased health risk because the particles can deposit deep in the lungs and may contain substances that are particularly harmful to human health.

Lead. Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, as discussed in detail below, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, EPA set national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The EPA banned the use of leaded gasoline in highway vehicles in December 1995 (EPA 2007a).

As a result of EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector have declined dramatically (95 percent between 1980 and 1999), and levels of lead in the air decreased by 94 percent between 1980 and 1999. Transportation sources, primarily airplanes, now contribute only 13 percent of lead emissions. A recent National Health and Nutrition Examination Survey reported a 78 percent decrease in the levels of lead in people's blood between 1976 and 1991. This dramatic decline can be attributed to the move from leaded to unleaded (EPA 2007a).

The decrease in lead emissions and ambient lead concentrations over the past 25 years is California's most dramatic air quality success story. The rapid decrease in lead concentrations can be attributed primarily to phasing out the lead in gasoline. This phase-out began during the 1970s, and subsequent CARB regulations have virtually eliminated all lead from gasoline now sold in California. All areas of the state are currently designated as attainment for the state lead standard (EPA does not designate areas for the national lead standard). Although the ambient lead standards are no longer violated, lead emissions from stationary sources still pose "hot spot" problems in some areas. As a result, CARB identified lead as a TAC.

Emissions Inventory. The most current emissions inventory for the SFBAAB is shown in Table 3.8-2 (CARB 2007a). An emissions inventory is a database that lists, by source, the amount of air pollutants discharged into the atmosphere of a community (e.g., air basin) during a given time period. According to the SFBAAB's emissions inventory, mobile sources are the largest contributors to the estimated annual average air pollutant levels accounting for approximately 45 percent of the total ROG, 89 percent of the total CO, 84 percent of the total NO_X, 17 percent of the total SO_X, and 11 percent of the total PM_{10} emissions.

Monitoring Station Data and Attainment Area Designations. Criteria air pollutant concentrations are measured at several monitoring stations in the SFBAAB. Table 3.8-3 summarizes the air quality data for the SFBAAB for the most recent three years, 2004 through 2006.

Table 3.8-2 SFBAAB 2006 Emissions Inventory

Source Type / Category	Estimated Annual Average Emissions (tons per day)				
	ROG	CO	NOx	SOx	PM10
Stationary Sources					
Fuel Combustion	4.1	34.4	42.7	15.3	4.9
Waste Disposal	2.6	--	0.2	--	--
Cleaning and Surface Coating	31.6	--	--	--	--
Petroleum Production and Marketing	23.7	0.6	0.8	22.7	0.8
Industrial Processes	11.3	1.6	3.9	7.7	9.6
Subtotal (Stationary Sources)	73.3	36.6	47.6	45.7	15.3
Area-Wide Sources					
Solvent Evaporation	70.9	--	--	--	--
Miscellaneous Processes	17.2	177.9	19.7	0.6	176.1
Subtotal (Area-wide Sources)	88.1	177.9	19.7	0.6	176.1
Mobile Sources					
On-road Motor Vehicles	128.4	1229.9	233.7	1.9	10.4
Other Mobile Sources	79.4	484.5	191.1	6.9	11.1
Subtotal (Mobile Sources)	207.8	1714.4	424.8	8.8	21.5
Grand Total for Air Basin	**369.2**	**1928.9**	**492.1**	**55.1**	**212.9**

Note: Data does not include emissions associated with natural sources.
Source: CARB 2007a

Both CARB and EPA use this type of monitoring data to designate areas according to attainment status for criteria air pollutants established by the agencies. The purpose of these designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. Unclassified is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of the nonattainment designation, called nonattainment-transitional. The nonattainment-transitional designation is given to nonattainment areas that are progressing and nearing attainment. The most current attainment designations for the SFBAAB are shown in Table 3.8-4 for each criteria air pollutant.

Toxic Air Contaminants

Concentrations of TACs are also used as indicators of ambient-air-quality conditions. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

According to the 2006 edition of the California Almanac of Emissions and Air Quality (California Air Resources Board 2006a), the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being PM from diesel-fueled engines (diesel particulate

Table 3.8-3 Summary of Annual Ambient Air Quality Data (2004–2006)

	2004	2005	2006
Ozone			
Maximum concentration (1-hr/8-hr, ppm)	0.090/0.068	0.113/0.080	0.118/0.087
Number of days state standard exceeded (1-hr) [1]	0	1	5
Number of days national standard exceeded (1-hr/8-hr) [1]	0/0	0/0	0/1
Respirable Particulate Matter (PM_{10})			
Maximum concentration (ppm)	58.1	53.5	73.2
Number of days state standard exceeded [1]	4	2	2
Number of days national standard exceeded [1]	0	0	0
Fine Particulate Matter ($PM_{2.5}$)			
Maximum concentration (ppm)	51.5	54.6	64.4
Number of days national standard exceeded [1]	0	0	0
Carbon Monoxide (CO)			
Maximum concentration (1-hr/8-hr, ppm)	4.4/3.0	4.3/3.1	4.1/2.9
Number of days state standard exceeded (1-hr/8-hr) [1]	0/0	0/0	0/0
Number of days national standard exceeded (1-hr/8-hr) [1]	0/0	0/0	0/0
Nitrogen Dioxide (NO_2)			
Maximum concentration (1-hr, ppm)	0.073	0.074	0.074
Number of days state standard exceeded (1-hr) [1]	0	0	0

Note: Data is from the San Jose-Jackson Street monitoring station, and is considered representative of ambient air quality conditions of the project site.

Where,
ppm = parts per million

[1] Measured days are those days that an actual measurement was greater than the level of the state daily standard or the national daily standard. Measurements are typically collected every six days. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of measured days above the standard is reported, but is not necessarily the number of violations of the standard for the year.

Sources: CARB 2007b, EPA 2007b

matter or diesel PM). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present. Unlike the other TACs, diesel PM does not have ambient monitoring data because an accepted measurement method does not currently exist. However, CARB has made preliminary concentration estimates for the state and its 15 air basins using a PM-based exposure method. The method uses the CARB emission inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies on chemical speciation of ambient data. These data were used, along with receptor modeling techniques, to estimate outdoor concentrations of diesel PM. Ten compounds pose the greatest known ambient risk based on air quality data, or concentration estimates in the case of diesel PM: acetaldehyde, benzene, 1,3-

Table 3.8-4 Ambient Air Quality Standards and Designations

Pollutant	Averaging Time	California		National Standards[1]		
		Standards[2,3]	Attainment Status [6]	Primary[3,5]	Secondary[3,6]	Attainment Status[7]
Ozone	1-hour	0.09 ppm (180 $\mu g/m^3$)	N (Serious)	–[9]	Same as Primary Standard	–[9]
	8-hour	0.070 ppm[8] (137 $\mu g/m^3$)		0.08 ppm (157 $\mu g/m^3$)		N (Marginal)
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	A	35 ppm (40 mg/m^3)	–	U/A
	8-hour	9 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (56 $\mu g/m^3$)	A	0.053 ppm (100 $\mu g/m^3$)	Same as Primary Standard	U/A
	1-hour	0.18 ppm (338 $\mu g/m^3$)		–		–
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	–	0.030 ppm (80 $\mu g/m^3$)	–	A
	24-hour	0.04 ppm (105 $\mu g/m^3$)	A	0.14 ppm (365 $\mu g/m^3$)	–	
	3-hour	–	–	–	0.5 ppm (1300 $\mu g/m^3$)	
	1-hour	0.25 ppm (655 $\mu g/m^3$)	A	–	–	–
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 $\mu g/m^3$	N	–[9]	Same as Primary Standard	U
	24-hour	50 $\mu g/m^3$		150 $\mu g/m^3$[6]		
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 $\mu g/m^3$	N	15 $\mu g/m^3$	Same as Primary Standard	U/A
	24-hour	No Separate State Standard	–	35 $\mu g/m^3$		

Table 3.8-4 (Continued) Ambient Air Quality Standards and Designations

Pollutant	Averaging Time	California		National Standards[1]		
		Standards[2,3]	Attainment Status [6]	Primary[3,5]	Secondary[3,6]	Attainment Status[7]
Lead [10]	30-day Average	1.5 $\mu g/m^3$	A	–	–	–
	Calendar Quarter	–	–	1.5 $\mu g/m^3$	Same as Primary Standard	A
Sulfates	24-hour	25 $\mu g/m^3$	A	**No National Standards**		
Hydrogen Sulfide	1-hour	0.03 ppm (42 $\mu g/m^3$)	U			
Vinyl Chloride[10]	24-hour	0.01 ppm (26 $\mu g/m^3$)	U/A			
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer —visibility of 10 miles or more (0.07—30 miles or more for Lake Tahoe) due to particles when the relative humidity is less than 70 percent.	U			

[1] National standards (other than ozone, PM, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. The PM10 24-hour standard is attained when 99 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. The PM2.5 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact USEPA for further clarification and current federal policies.

[2] California standards for ozone, CO (except Lake Tahoe), SO2 (1- and 24-hour), NO2, PM, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[3] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4] Unclassified (U): a pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.
Attainment (A): a pollutant is designated attainment if the state standard for that pollutant was not violated at any site in the area during a three-year period.
Nonattainment (N): a pollutant is designated nonattainment if there was a least one violation of a state standard for that pollutant in the area.
Nonattainment/Transitional (NT): is a subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the standard for that pollutant.

[5] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[6] On January 20, 2005, the Air Resources Board adopted changes to the state area designations for ozone, PM10, PM2.5, and carbon monoxide (CO), based on air quality data collected during 2001 through 2003. These state area designations have been approved by the State Office of Administrative Law, and they become effective on July 23, 2005.

Table 3.8-4 (Continued) Ambient Air Quality Standards and Designations

Pollutant	Averaging Time	California		National Standards[1]		
		Standards[2,3]	Attainment Status [6]	Primary[3,5]	Secondary[3,6]	Attainment Status[7]

National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[7] Nonattainment (N): any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.

Attainment (A): any area that meets the national primary or secondary ambient air quality standard for the pollutant.

Unclassifiable (U): any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

[8] This concentration was approved by CARB on April 28, 2005 and is expected to become effective in early 2006.

[9] The 1-hour ozone NAAQS was revoked on June 15, 2005. The annual PM_{10} NAAQS was revoked in 2006.

[10] CARB has identified lead and vinyl chloride as toxic air contaminants with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Sources: CARB 2007c, EPA 2007c

butadiene, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, and diesel PM.

In general, for those TACs that may cause cancer, there is no concentration that does not present some risk (CARB 2006). In other words, there is no threshold level below which adverse health impacts may not be expected to occur.

Odors

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell very minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor and in fact an odor that is offensive to one person may be perfectly acceptable to another (e.g., fast food restaurant). It is important to also note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word strong to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

Sources of existing odor in the Alviso Slough Restoration Project area include nearby salt ponds. When algae and other biomass (which grow in the ponds) naturally decompose, hydrogen sulfide gas can be produced, which generates odors. In addition, odors are generated when the ponds dry and the mud bottoms are exposed to air (exposure of algae or brine shrimp). No odor complaints have been received in the Alviso pond complex since USFWS took over management of the ponds, nor has the District received complaints of odor associated with the Alviso Slough.

Attributing Climate Change - The Physical Scientific Basis

Climate is the accumulation of daily and seasonal weather events over a long period of time, whereas weather is defined as the condition of the atmosphere at any particular time and place (Ahrens 2003). Various gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature and local climates. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth, not as high-frequency solar radiation, but lower frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. The earth has a much lower temperature than the sun; therefore, the earth emits lower frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the Greenhouse Effect, is responsible for maintaining a habitable climate on Earth. Without the Greenhouse Effect, Earth would not be able to support life as we know it.

Prominent GHGs contributing to the Greenhouse Effect are carbon dioxide (CO_2), methane (CH_4), ozone, nitrous oxide, hydrofluorocarbons, chlorofluorocarbons, and sulfur hexafluoride. Human-caused emissions of these GHGs in excess of natural ambient concentrations are responsible for intensifying the Greenhouse Effect and have led to a trend of unnatural warming of the earth's climate, known as global climate change or global warming (Ahrens 2003). It is *extremely unlikely* that global climate change of the past 50 years can be explained without the contribution from human activities (Intergovernmental Panel on Climate Change [IPCC] 2007).

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and TACs, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about one day), GHGs have long atmospheric lifetimes (one year to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the exact lifetime of any particular GHG molecule is dependent on multiple variables and cannot be pinpointed, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO_2 emissions, approximately 54 percent is sequestered through ocean uptake, uptake by northern hemisphere forest regrowth, and other terrestrial sinks within a year, whereas the remaining 46 percent of human-caused CO_2 emissions remains stored in the atmosphere (Seinfeld and Pandis 1998).

Similarly, impacts of GHGs are borne globally, as opposed to localized air quality effects of CAPs and TACs. The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; suffice to say, the quantity is enormous, and no single project alone would be expected to measurably contribute to a noticeable incremental change in the global average temperature, or to global, local, or micro climate. From the standpoint of CEQA, GHG impacts to global climate change are inherently cumulative.

Project Area

BAAQMD operates a regional air quality monitoring network that regularly measures the concentrations of the major criteria air pollutants. The nearest air quality monitoring station to the Alviso Slough Restoration Project area is San Jose-Jackson Street Station. The ambient air quality concentrations taken at this monitoring station are the best representations of air quality at the Project area (see Table 3.8-2). Monitoring data from these stations show that PM_{10} levels have exceeded ambient air quality standards consistently from 2004 through 2006. State ozone standards were not exceeded in 2004 in the vicinity of the monitoring station, although exceedances occurred in 2005 and 2006. $PM_{2.5}$, CO, and NO_2 emissions have consistently been below ambient air quality standards since 2004.

Land uses such as schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because infants and children, the elderly, and people with health afflictions, especially respiratory ailments, are more susceptible to respiratory infections and other air quality-related health problems than the general public. Residential areas are also considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Sensitive receptors are identified for the Alviso Slough Restoration Project below.

There are no sensitive receptors at the Project site. The nearest sensitive receptors are residences in the community of Alviso, specifically the Summerset Mobile Estates located 400 feet from the Project site. One school (George Mayne Elementary School) is located in the community of Alviso, located more than 0.5 mile east of the Project site.

3.8.3 Environmental Impacts and Mitigation

Overview

The assumptions presented in Chapter 2 regarding the type of construction equipment that would be used also apply to this air quality impact analysis.

Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, a significant air quality impact would occur if the Project would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number or people.

As stated in Appendix G, the significance standards established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. Thus, as specified by BAAQMD (BAAQMD 1999), implementation of the Project would result in significant air quality impacts if:

- All control measures in compliance with the recommendations of BAAQMD are not incorporated into project design or implemented during project construction;
- Long-term operational (regional) emissions of ROG, NO_X, or PM_{10} exceed the BAAQMD-recommended mass emissions thresholds of 80 pounds per day (lb/day) or 15 tons per year (TPY); - Does not apply; construction-only impacts
- Long-term operational local mobile-source emissions of CO results in or substantially contribute to emissions concentrations that exceed the one-hour ambient air quality standard of 20 ppm or the eight-hour standard of 9 ppm; and – Does not apply; construction-only impacts
- Exposure of sensitive receptors to TAC emissions that exceed 10 in 1 million for the carcinogenic risk (i.e., the risk of contracting cancer) and/or a noncarcinogenic Hazard Index of 1 for the Maximally Exposed Individual (MEI).

No air district in California, including the BAAQMD, has identified a significance threshold for GHG emissions generated by a proposed project, or a methodology for analyzing impacts related to GHG emissions or global climate change. By adoption of AB 32 and SB 97, however, the State of California has established GHG reduction targets and has determined that GHG emissions as they relate to global climate change are a source of adverse environmental impacts in California. Although AB 32 did not amend CEQA, the legislation does include language identifying the various environmental problems in California caused by global warming (Health & Saf. Code, § 38501(a).) SB 97, in contrast, did amend CEQA to require the Office of Planning and Research (OPR) to prepare CEQA Guidelines revisions addressing the mitigation of GHGs or their consequences. By only giving certain limited projects protection against CEQA claims based on the alleged failure to properly assess climate change impacts in the environmental documents used to approve them, the Legislature implied that the environmental review for other projects would have to address the issue of global warming when impacts are potentially significant (project-level or cumulative). In any event, the proper context for addressing the issue in an EIR is the discussion of cumulative impacts, since while the emissions of one single project will not cause global climate change, GHG emissions from multiple projects throughout the world could result in a cumulative impact with respect to global climate change.

To meet GHG emission targets of AB 32, California would need to generate in the future less GHG emissions than current levels. It is recognized, however, that for most projects there is no simple metric available to determine if a single project would substantially increase or decrease overall GHG emission levels or conflict with the goals of AB 32.

Although the text of AB 32 strongly suggests that, when CARB interprets and applies the definition of "Greenhouse gas emission source," the regulations promulgated pursuant to the legislation will apply primarily, if not exclusively, to stationary sources of GHG emissions (see Health & Safety Code, § 38505(i)), this mandate demonstrates California's commitment to reducing the rate of GHG emissions and the state's associated contribution to climate change, without intent to limit population or economic growth within the state. Thus, to achieve the goals of AB 32, which are tied to GHG emission rates of specific benchmark years (i.e., 1990), California would have to achieve a lower rate of emissions per unit of population (per person) than it has now. Further, in order to accommodate future population and economic growth, the state would have to achieve an even lower rate of emissions per unit than was achieved in 1990. (The goal to achieve 1990 quantities of GHG emissions by 2020 means that this will need to be accomplished with 30 years of population and economic growth beyond 1990 in place.) Thus, future projects that would not encourage reductions in GHG emissions (or continue at "Business as Usual" emission rates) would conflict with the policy decisions contained in the spirit of AB 32, thus impeding California's ability to comply with the mandate.

While the text of AB 32 focuses on major stationary and area sources of GHG emissions, the primary objective of AB 32 is to reduce California's contribution to global warming by reducing California's total annual production of GHG emissions. The impact that GHG emissions have on global climate change is not dependent on whether they were generated by stationary, mobile, or area sources, or whether they were generated in one region or another. Thus, the consistency with the state's requirements for GHG emissions reductions is the best metric for determining whether the proposed project would contribute to global warming. In the case of the proposed project, if the project does not conform with the state mandate to reduce GHG emissions to 1990 levels by the year 2020 and the associated increase in the amount of mass emissions is considered to be substantial, then the impact of the project would be cumulatively considerable (significant).

There is no available or recommended methodology (at least, not adopted by any air district or state agency) for evaluating GHG emissions from projects. In the case of the proposed project, criteria air pollutants, precursors, and CO_2 emissions associated with project construction were modeled using URBEMIS 2007 version 9.2.2, a widely-used, CARB-approved model used in regional air quality analysis. CO_2 emissions were used as a proxy for all GHG emissions associated with the project, and are discussed in the Cumulative impacts discussion in Chapter 4. All other impacts were evaluated in accordance with BAAQMD recommendations.

Impacts and Mitigation

The impacts analysis in this ~~Draft~~ Final EIR evaluates five action alternatives and the required No Project alternative. The action alternatives include vegetation removal and/or dredging, as described in Chapter 2. Under the No Project alternative, the District would not take any action in the Project area and existing programs would continue. The analysis covers impacts from the initial construction and maintenance phases– both in the slough and at staging areas.

All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by BCDC, CSLC, the District, or SBYC by the time of commencement of construction of this Project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Table 3.8-5 lists each impact identified for the proposed alternatives, along with the significance of each impact. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (less than significant and does not require mitigation), or Class IV (beneficial). Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections.

Table 3.8-5 Impact and Mitigation Summary

Impact	Impact Significance	Mitigation Measures
Impact AQ-1: Project-generated, short-term construction-related criteria air pollutant and precursor emissions. (i) Construction-generated fugitive PM10 dust emissions (ii) Construction-generated NOx emissions	(i) Alts. 1-5: Class III~~*~~ (ii) Alts. 1-5: Class III*	AQ BMPs~~-A~~
	Alt. 6: No Impact	--
Impact AQ-2: Potential exposure of sensitive receptors to TAC emissions.	Alts. 1-5: Class II	~~AQ-A~~ AQ-B
	Alt 6: No Impact	--
Impact AQ-3: Potential introduction of unpleasant odor from vegetation removal.	Alts. 1-5: Class III	--
	Alt 6: No Impact	--
Notes: The impacts and mitigation would be the same both with and without the SBSP Restoration Project. * The impact classifications for PM_{10} and NO_X are different.		

Impact AQ-1: **Project-Generated, short-term construction-related criteria air pollutant and precursor emissions.**

Summary – Common to All Alternatives

In general, construction activities are considered short-term or temporary, and would not occur continuously throughout the entire 10-year planning horizon. Although construction emissions are short-term or temporary in duration, they have the potential to represent a significant impact with respect to air quality. ROG and NO_X emissions are primarily associated with equipment exhaust and the application of architectural coatings. Fugitive PM_{10} dust emissions are primarily associated with earthmoving activities (e.g., site preparation, excavation, stockpiling) and vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of disturbance area, and vehicle miles traveled (VMT) by construction vehicles on- and off-site (e.g., disposing of vegetation and sediment).

Alternatives 1, 2, 3, 4, and 5

Vegetation removal and/or dredging activities for Alternatives 1 through 5 would result in temporary construction emissions that have the potential to represent a significant impact with respect to air quality. Emissions would be localized in the area where construction activities would occur, and are not expected to expose sensitive receptors to substantial pollutant concentrations due to the distance from sensitive receptors (sensitive receptors [e.g., residences] would be located more than approximately 500 feet from the construction area).

Construction activities would mainly result in the temporary generation of emissions from vegetation removal, dredging activities, and disposal activities. Excavation activities associated with the lowering of the weir and flood protection improvements (e.g., grading) as proposed in Mitigation Measures HYD-A and HYD-E, respectively (see Section 3.1, Hydrology and Geomorphology), would also result in the temporary generation of emissions. On-site construction equipment would likely include several Aquamogs and excavators, front-end loader, bulldozer, small barges, dump trucks, and a water truck. A crane and piledriver may also be used during construction activities. For the purposes of this impact analysis, any of the construction equipment may be operated simultaneously. In addition, truck trips associated with the hauling of dredged materials, equipment, and material and worker trips would occur. As identified in Chapter 2, approximately 80,000 c.y. of vegetation and 200,000 c.y. of dry dredged material may be hauled off site for disposal. This analysis assumes the vegetation and dredged material would be transported by trucks only (with storage capacity of 12 c.y. per truck). Alternative 5 is expected to result in worst-case pollutant emissions, because it is anticipated to have the most intense construction activity associated (e.g., area disturbed and quantity of equipment) among all alternatives. Worst-case daily and annual construction-generated emissions were modeled for Alternative 5 and are summarized below in Tables 3.8-6 and 3.8-7.

According to BAAQMD, PM_{10} is the pollutant of greatest concern with respect to construction-generated emissions. This is why BAAQMD has no mass emission thresholds for construction emissions of ROG and NO_X and instead recommends that determination of significance for construction emissions be based on successful implementation of dust control measures (BAAQMD 1999). ~~However, since project operation (i.e., maintenance) involves up to 10 years of maintenance activities that would be similar in~~

Table 3.8-6 Summary of Worst-Case Daily Construction-Generated Emissions for Alternative 5

	ROG (lb/day)	NO_X (lb/day)	PM_{10} (lb/day)
Phase 1: Vegetation Removal (Summer 2009)			
Fugitive Dust	-	-	50.0
Off-Road Mobile Exhaust	14.8	147.7	6.1
On-Road Mobile Exhaust	0.3	5.2	0.2
Worker Trips	0.3	0.4	-
Total Vegetation Removal Emissions	15.4	153.3	56.3
Phase 2: Dredging (Summer 2009-Fall 2010)			
Fugitive Dust	-	-	48.4
Off-Road Mobile Exhaust	14.1	138.9	5.5
On-Road Mobile Exhaust	0.9	14.6	0.5
Worker Trips	0.2	0.4	-
Total Dredging Emissions	15.2	153.9	54.4
Worst-Case Unmitigated Daily Emissions (Phases 1 and 2 Conducted Simultaneously)	30.6	307.2	110.7
No thresholds for construction – not applicable ~~BAAQMD Operational Significance Threshold~~	~~80~~	~~80~~	~~80~~
~~Exceed Threshold?~~	~~N~~	~~Y~~	~~Y~~
Sources: Data modeled by EDAW 2007			

~~nature to construction activities, it is assumed that construction-generated emissions would be similar to emissions generated during operation of the project. Therefore, BAAQMD's thresholds for operational emissions of these pollutants were applied to both construction- and operation-related emissions. Unmitigated emissions of NO_X and PM_{10} would likely exceed the applicable thresholds.~~

In addition, because BAAQMD's-required control measures are ~~not~~ currently incorporated into Project Alternatives 1 through 5 as proposed, construction-generated emissions ~~may~~ will not violate an air quality standard or contribute substantially to an existing or projected air quality violation. ~~As a result, this impact would be potentially significant.~~

BAAQMD's approach to CEQA analyses of construction-generated fugitive PM_{10} dust emissions is to require implementation of effective and comprehensive control measures. BAAQMD requires that all feasible control measures, which are dependent on the size of the construction area and the nature of the construction activities involved, shall be incorporated into Project design or implemented during Project construction. This would be considered a **Less than Significant** ~~**with Mitigation**~~ with implementation of the ~~following measure~~District's standard BMPs for Air Quality, built into the project.

Table 3.8-7 Summary of Worst-Case Annual Construction-Generated Emissions for Alternative 5

	ROG (TPY)	NO$_X$ (TPY)	PM$_{10}$ (TPY)
Phase 1: Vegetation Removal (Summer 2009)			
Fugitive Dust	-	-	2.0
Off-Road Mobile Exhaust	0.6	5.8	0.2
On-Road Mobile Exhaust	-	0.2	-
Worker Trips	-	-	-
Total Vegetation Removal Emissions	0.6	6.0	2.2
Phase 2: Dredging (Summer 2009-Fall 2010)			
Fugitive Dust	-	-	1.8
Off-Road Mobile Exhaust	0.5	5.2	0.2
On-Road Mobile Exhaust	-	0.6	-
Worker Trips	-	-	-
Total Dredging Emissions	0.5	5.8	2.0
Worst-Case Unmitigated Daily Emissions (Phases 1 and 2 Conducted Simultaneously)	1.1	11.8	4.2
BAAQMD Operational Significance Threshold	15	15	15
Exceed Threshold?	N	N	N
Sources: Data modeled by EDAW 2007 (Appendix D)			

- ~~**Mitigation Measure AQ-A: Control measures for short-term construction-generated emissions.**~~

The following SCVWD BMPs for Air Pollution ~~Basic Control Measures~~ shall be implemented at all construction sites within the Project area, regardless of size.

Air Quality		
AQ-1	**BAY AREA AIR QUALITY MANAGEMENT DISTRICT BASIC DUST CONTROL MEASURES (ALL CONSTRUCTION SITES)**	Implement Bay Area Air Quality Management District (BAAQMD) Basic Control Measures for construction emissions of PM$_{10}$ at all construction sites. Current measures stipulated by the BAAQMD CEQA Guidelines include the following (BAAQMD 1999): 1. Active areas shall be watered at least twice per day unless soils are already sufficiently moist to avoid dust. The amount of water must be controlled so that runoff from the site does not occur, yet dust control is achieved. 2. Trucks hauling soil, sand, and other loose materials shall be covered or shall maintain at least two feet of freeboard. 3. Unpaved access roads, parking areas and staging areas at construction sites shall be paved, watered three times daily, or non-toxic soil stabilizers shall be applied to control dust generation. 4. Paved site access roads, parking areas, and staging areas shall be

Air Quality		
		swept daily (with vacuum-powered street sweepers). 5. Paved public streets shall be swept (with vacuum-powered street sweepers) if visible soil material is carried onto adjacent paved surfaces.
		Source: BAAQMD CEQA Guidelines
AQ-2	**BAY AREA AIR QUALITY MANAGEMENT DISTRICT ENHANCED DUST CONTROL MEASURES (SITES GREATER THAN 4 ACRES IN SIZE)**	For sites greater than four acres in size, implement Bay Area Air Quality Management District Enhanced Dust Control Measures. Current measures stipulated by the BAAQMD CEQA Guidelines include the following (BAAQMD 1999): 1. All BAAQMD "Basic" control measures. 2. Inactive areas (previously graded areas inactive for ten days or more) shall be sprayed with soil stabilizer or seeded. 3. Exposed stockpiles (dirt, sand, etc.) shall be watered twice daily, enclosed, covered, or sprayed with soil stabilizers. 4. Traffic speeds on unpaved roads shall be limited to 15 mph. 5. Sandbags or other bank protections shall be installed to prevent silt runoff to roadways. 6. Vegetation in disturbed areas shall be replanted as soon as horticulturally appropriate. For example, plant material may not be ready as soon as the job is done (e.g. willow cuttings have to be collected during winter dormancy).
		Source: BAAQMD CEQA Guidelines
AQ-3	**BAY AREA AIR QUALITY MANAGEMENT DISTRICT OPTIONAL DUST CONTROL MEASURES** **(Individual optional control measures may be incorporated, as appropriate)**	Implement appropriate Bay Area Air Quality Management District (BAAQMD) Optional Control Measures for construction emissions of PM$_{10}$ at all construction sites. BAAQMD Optional Control Measures are strongly encouraged at construction sites that are large in area, located near sensitive receptors, or which for any other reason may warrant additional emissions reductions. Current measures stipulated by the BAAQMD CEQA Guidelines include the following (BAAQMD 1999): 1. Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site. 2. Install wind breaks or plant trees/vegetation wind breaks at windward side(s) of construction areas. 3. Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph. 4. Limit the area subject to excavation, grading, and other construction activity at any one time. Additional District control measures that may be used if applicable

Air Quality		
		include: 5. Tailgates of trucks shall be sealed. 6. Trucks shall be brushed down before leaving the site.
		Source: BAAQMD CEQA Guidelines; SMP Provision No. 5.1

- ~~The District, or its contractor, shall water all active construction areas at least twice daily;~~
- ~~The District, or its contractor, shall cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two ft (0.6 m) of freeboard;~~
- ~~The District, or its contractor, shall pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites;~~
- ~~The District, or its contractor, shall sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites;~~
- ~~The District, or its contractor, shall sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets;~~
- ~~Pursuant to BAAQMD Rule 6, the District shall ensure that emissions from all off-road diesel-powered equipment used on the Project site do not exceed 40 percent opacity for more than three minutes in any one hour. Any equipment found to exceed 40 percent opacity (or Ringelmann 2.0) shall be repaired immediately, and the District and BAAQMD shall be notified within 48 hours of identification of noncompliant equipment. A visual survey of all in-operation equipment shall be made at least weekly, and a monthly summary of the visual survey results shall be submitted throughout the duration of the Project to the District, except that the monthly summary shall not be required for any 30-day period in which no construction activity occurs. The monthly summary shall include the quantity and type of vehicles surveyed as well as the dates of each survey. BAAQMD and/or other officials may conduct periodic site inspections to determine compliance;~~
- ~~The District shall provide a plan for approval by BAAQMD demonstrating that the heavy-duty (more than 50 horsepower) off-road vehicles to be used in the construction~~

~~Project, including owned, leased, and subcontractor vehicles, would achieve a Project-wide fleet average 45 percent particulate reduction compared to the most recent CARB fleet average. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, alternative fuels (e.g., Lubrizol, Puri NO$_X$, biodiesel fuel) in all heavy duty off road equipment;~~

- ~~The District shall require in construction plans and specifications that the model year of all off-road construction moving equipment shall not be older than 1996;~~
- ~~The District shall require in construction plans and specifications a provision that prohibits contractors from operating pre-1996 heavy-duty diesel equipment on forecast Spare-the-Air Days or on days when air quality advisories are issued because of special circumstances (e.g., wildfires, industrial fires); and~~
- ~~The District shall minimize idling time to 10 minutes for all heavy-duty equipment when not engaged in work activities, including on-road haul trucks while being loaded or unloaded on site.~~

~~The following Enhanced Measures shall be implemented at construction sites larger than four acres:~~

- ~~The District, or its contractor, shall hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously disturbed areas inactive for 10 days or more) – as appropriate;~~
- ~~The District, or its contractor, shall enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles that are not being actively turned for drying;~~
- ~~The District, or its contractor, shall limit traffic speeds on unpaved roads to 15 mph;~~
- ~~The District, or its contractor, shall install sandbags or other erosion control measures to prevent silt runoff to public roadways;~~
- ~~The District, or its contractor, shall replant vegetation in disturbed areas as quickly as possible; and~~
- ~~The District, or its contractor, shall install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site.~~

~~These additional "Optional Measures" shall be implemented if further emission reductions are deemed necessary by the BAAQMD:~~

- ~~The District, or its contractor, shall suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph; and~~
- ~~The District, or its contractor, shall limit the area subject to excavation, grading and other construction activity at any one time.~~

According to BAAQMD, if the required ~~mitigation~~ measures (District BMPs) are implemented during project construction, short-term generated emissions would be reduced to a less-than-significant level. It is anticipated that successful implementation of all above measures would substantially reduce PM$_{10}$ emissions (by an estimated 50-75 percent). This would be sufficient to reduce PM$_{10}$ emissions to below BAAQMD's 80 lb/day threshold. ~~However, due to the intensity of material hauling required and lack of available, feasible mitigation measures to reduce resultant NO$_X$ emissions associated with on-road diesel~~

~~exhaust, NO_X emissions would not be reduced to below the 80 lb/day threshold. Short-term emissions (approximately every three to five years whenever activities occur) of construction-generated NO_X would remain **Significant and Unavoidable.**~~

Alternative 6: No Project

The following discussion addresses the No Action Alternative at the project level.

The No Action Alternative would not involve any construction activities associated with widening or deepening Alviso Slough between Gold Street and Alviso Marina County Park. As such, no appreciable short- or long-term emissions would result. There would be **No Impact**.

Impact AQ-2: **Potential exposure of sensitive receptors to TAC emissions.**

Summary – Common to All Alternatives

Short-Term Construction Equipment. Construction activities associated with Alternatives 1 through 5 would result in short-term diesel exhaust emissions from on-site heavy duty equipment. Diesel PM were identified as a TAC by CARB in 1998. Construction of these alternatives would result in the generation of diesel PM emissions from the use of off-road diesel-powered equipment required for site excavation and other construction activities. According to CARB, the potential cancer risk from the inhalation of diesel PM, as discussed below, outweighs the potential non-cancer health impacts (CARB 2003).

Alternatives 1, 2, 3, 4, and 5

Construction equipment emissions will be reduced over the period of Project development. In January 2001, EPA promulgated a Final Rule to reduce emission standards for 2007 and subsequent model year heavy-duty diesel engines. These emission standards represent a 90 percent reduction in NO_X, a 72 percent reduction of non-methane hydrocarbon (NMHC) emissions, and a 90 percent reduction of PM emissions in comparison to the 2004 model year emission standards. In December 2004, CARB adopted a fourth phase of emission standards (Tier 4) in the Clean Air Non-road Diesel Rule that are nearly identical to those finalized by EPA on May 11, 2004. As such, engine manufacturers are now required to meet after treatment-based exhaust standards NO_X and PM starting in 2011 that are over 90 percent lower than current levels, putting emissions from off-road engines virtually on par with those from on-road heavy-duty diesel engines.

The dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the MEI. Thus, the risks estimated for a MEI are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the Project (Salinas, pers. comm., 2004). Thus, the proposed project would have associated exposure duration of less than 14 percent of the 70-year period.

Because the use of off-road construction equipment would be temporary in combination with the highly dispersive properties of diesel PM (Zhu and Hinds 2002), future reductions in exhaust emissions, and construction-related activities would not be typical in comparison to similar development-type projects (i.e., no excessive material transport or associated truck travel would be expected during each phase of construction), short-term construction activities are not expected to expose sensitive receptors to substantial TAC emissions given the distances of most sensitive receptors (at least 500 feet from proposed equipment activity). Thus, this impact would be considered **Less than Significant.**

In addition to TAC generated from diesel PM, soil disturbance during construction activities (including mass grading and excavation) may result in airborne entrainment of contaminants (e.g., mercury) in fugitive dust. The entrainment of mercury has the potential to expose workers and to health hazards, although the concentrations of these contaminants in fugitive dust emissions are not anticipated to reach levels that may present significant risks. This impact would be considered **Less Than Significant with Mitigation**. Implementation of dust control measures ~~(~~and implementation of ~~air quality monitoring~~a Health & Safety Plan (Mitigation Measure AQ-B) would ensure and confirm that fugitive dust would not present unacceptable health risks to workers and nearby residents.

- **~~Mitigation Measure AQ-A~~District BMPs listed on page 3.8-22: Control measures for short-term construction-generated emissions,** applies here.
- **Mitigation Measure AQ-B*:* Health and Safety Plan.**

  The District and/or its contractors shall prepare a Health and Safety Plan that includes Project-specific monitoring procedures and action levels for dust. The portion of the plan that relates to the control of toxic contaminants contained in fugitive dust shall be prepared in coordination with BAAQMD. The recommendations of BAAQMD to prevent the exposure of sensitive receptors to levels above applicable thresholds (probability of contracting cancer for MEI that exceeds 10 in one million or if ground level concentrations of non-carcinogenic contaminants result in hazard index greater than one for the MEI) shall be implemented. The Health and Safety Plan, applicable to all excavation activities, shall establish policies and procedures to protect workers and the public from potential hazards posed by hazardous materials. The plan shall be prepared according to federal and California OSHA regulations. The landowners and/or its contractors shall maintain a copy of the Plan on-site during construction activities.

Alternative 6: No Project

Under this alternative, no construction activities would occur within the Project area. As such, there would be **No Impact** associated with the potential for exposure of workers to TAC emissions from use of equipment.

Impact AQ-3: Potential introduction of unpleasant odor from vegetation removal.

Summary – Common to All Alternatives

Vegetation removal would occur as a result of all action alternatives. Once removed, the material can be hauled directly to the disposal location, but some or all may need to be stored at staging areas for several days to maximize construction efficiency. It is not expected that the vegetation at the staging areas would remain there for more than one week.

Alternatives 1, 2, 3, 4, and 5

Under all action alternatives, the removed vegetation may sit at staging areas for up to one week before being hauled to the disposal facility. Any odor occurring as a result of decaying plant material at the staging areas would be temporary and is considered **Less than Significant** and no mitigation is proposed. District Air Quality BMP AQ-4 would be applied here.

Alternative 6: No Project

Alternative 6 would not result in the removal or storage of vegetation and therefore **No Impact** would occur.

3.8.4 Relationship to South Bay Salt Ponds Phase 1 Action at Pond A8

Implementation of the Phase 1 Action at Pond A8 may slightly reduce the total amount of maintenance required by the Alviso Slough Restoration Project, thereby reducing the maintenance intervals or the number of trucks required for each interval. This, in turn, could reduce the overall impact to air quality as a result of this Project. Because this reduction in maintenance intervals or trucks cannot predicted with accuracy, it is assumed that the impacts and mitigation required under this scenario would be the same as stated above.

3.8.5 Sediment Disposal Options

Sediment disposal options include trucking, barging, or conveying (e.g., slurry pipeline) the dredged sediment to a location here it could be re-used, rather than trucking the material to the Newby Island Landfill, as described in Chapter 2.

In the case of hauling the material to an alternative site, the impact to air quality would be the same. Barging or slurry pipe movement of the material would significantly reduce the number of truck trips required; however, a detailed description of the final disposal or re-use destination, number of barges, and /or length of slurry pipeline would be required to determine if the impact class would be different than that for hauling by truck. These disposal options would likely require additional or modified mitigation than those proposed above.

3.9 NOISE (NOI)

This section includes a description of acoustic fundamentals, applicable noise regulations, and existing ambient noise conditions, and an analysis of potential short- and long-term noise impacts associated with the proposed project.

3.9.1 Regulatory Setting

A review of noise regulations is presented in Table 3.9-1 below, with additional information presented in Tables 3.9-2 through 3.9-5. Noise is regulated in the Alviso Slough Restoration Project area through implementation of local general plan policies and noise regulations. Local general plans identify general principles intended to guide and influence development plans, and noise regulations set forth specific standards and procedures for addressing particular noise sources and activities.

The purpose of noise regulations is to protect the health and welfare of the public by minimizing excessive, unreasonable, and unnecessary noise. Each jurisdiction defines unacceptable noise levels, and in most cases, noise level standards and work hour limitations, to achieve this goal.

Table 3.9-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
FEDERAL	
U.S. EPA	In response to the Federal Noise Control Act of 1972, the U.S. EPA has identified noise levels requisite to protect public health and welfare against hearing loss, annoyance, and activity interference (EPA 1974) (Table 3.9-2). One of the purposes of this document is to provide a basis for state and local governments' judgments in setting standards (e.g., maximum allowable noise levels specified in the noise ordinance or general plan noise element for residential land uses). The information presented by EPA must be used along with other relevant factors: the balance between costs and benefits associated with setting standards at particular noise levels, the nature of the existing or projected noise problems in any particular area, and the local aspirations and the means available to control environmental noise. The document identifies a 24-hour exposure level of 70 A-weighted decibels (dBA[1]) as the level of environmental noise that will prevent any measurable hearing loss over a lifetime (EPA 1974). Likewise, levels of 55 dBA outdoors and 45 dBA indoors are identified as preventing activity interference and annoyance. These noise levels are considered those that will permit spoken conversation and other activities such as sleeping, working, and recreation, which are part of the daily human condition. The levels are not single-event or "peak" levels. Instead, they represent averages of acoustic energy over periods of time such as 8 or 24 hours, and over even longer periods of time (e.g., years).

---

[1] A-weighted decibel (dBA) is a measure on a logarithmic scale that indicates the squared ratio of sound pressure to a reference sound pressure. A-weighted (A) refers to the specific frequency-dependent rating scale that is used to approximate human response.

Table 3.9-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
U.S. Department of Transportation	The U.S. Department of Transportation (DOT), Federal Highway Administration (FHWA), has established two types of criteria for evaluating noise impacts associated with highway projects: one related to land-use type and the other to the existing noise levels. The first type of noise assessment criteria (NAC) is shown in Table 3.9-3. FHWA requires that primary consideration be given to exterior areas (Activity Categories A, B, and C). The interior noise NAC is used only where either there are no affected exterior activities or exterior activities are not affected because of sufficient distance or shielding from the roadway. The second type of NAC is a substantial (e.g., 10-dBA) increase in existing noise levels. The DOT, Federal Transit Administration (FTA), has established a methodology for the assessment of construction source noise levels (FTA 2006). Unless local noise ordinances can be found to apply, this methodology can be used to develop criteria on a project-specific basis. For major construction projects where a known noise-sensitive receptor (e.g., residential land use) is adjacent to the site, the use of the levels in Table 3.9-4 is recommended. To address the human response to groundborne vibration, FTA has also set forth guidelines for maximum-acceptable vibration criteria for different types of land uses. These include 65 vibration decibels (VdB) referenced to 1 microinch per second (μin/sec) and based on the root mean square (RMS) velocity amplitude for land uses where low ambient vibration is essential for interior operations (e.g., hospitals, high-tech manufacturing, laboratory facilities); 80 VdB for residential uses and buildings where people normally sleep; and 83 VdB for institutional land uses with primarily daytime operations (e.g., schools, churches, clinics, offices) (FTA 2006). Standards have also been established to address the potential for groundborne vibration to cause structural damage to buildings. These standards were developed by the Committee of Hearing, Bio Acoustics, and Bio Mechanics (CHABA) at the request of EPA (FTA 2006). For fragile structures, CHABA recommends a maximum limit of 0.25 inch per second (in/sec) peak particle velocity (PPV) (FTA 2006).
STATE	
Governor's Office of Planning and Research	The State of California, Governor's Office of Planning and Research (OPR), published the State of California General Plan Guidelines (OPR 2003), which provides guidance for the acceptability of projects within specific day-night average noise level (L_{dn})[2] contours. Table 3.9-5 summarizes acceptable and unacceptable community noise exposure limits for various land use categories. Generally, residential uses (e.g., mobile homes) are considered to be acceptable in areas where exterior noise levels do not exceed 60 dBA L_{dn}. Residential uses are normally unacceptable in areas exceeding 70 dBA L_{dn} and conditionally acceptable within 55–70 dBA L_{dn}. Schools are normally acceptable in areas up to 70 dBA L_{dn} and normally unacceptable in

---

[2] Day-night level (Ldn) is the energy-average of the A-weighted noise levels during a 24-hour period with 10 dBA added to the night (10 p.m.–7 a.m.) hours.

Table 3.9-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
	areas exceeding 70 dBA L_{dn}. Commercial uses are normally acceptable in areas up to 70 dBA CNEL[3]. Between 67.5 and 77.5 dBA L_{dn}, commercial uses are conditionally acceptable, depending on the noise insulation features and the noise reduction requirements. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.
California Department of Transportation	For the protection of fragile, historic, and residential structures, the California Department of Transportation (Caltrans) recommends a more conservative threshold of 0.2 in/sec PPV for normal residential buildings and 0.08 in/sec PPV for old or historically significant structures (Caltrans 2004). These standards are more stringent than the federal standard established by CHABA, presented above.
LOCAL	
City of San Jose	The Noise Element of the City of San Jose General Plan contains policies designed to accomplish the following goals: minimize the impact of noise on people through noise reduction and suppression techniques, and through appropriate land use policies. The City of San Jose General Plan 2020 was adopted in 1994 and is currently being updated (GP 2040). The Noise Element contains the following policies that relate to the proposed project: 1. The City's acceptable noise level objectives are 55 DNL (or L_{dn}) as the long-range exterior noise quality level, 60 DNL as the short-range exterior noise quality level, 45 DNL as the interior noise quality level, and 76 DNL as the maximum exterior noise level necessary to avoid significant adverse health effects. These objectives are established for the City, recognizing that the attainment of exterior noise quality levels in the environs of the San Jose International Airport, the Downtown Core Area, and along major roadways may not be achieved in the time from of this Plan. 2. The City should continue to require safe and compatible land uses within the international Airport noise zone (defined by the 65 CNEL contour as set forth in State Law) and should also encourage operating procedures which minimize noise. 3. Construction operations should use available noise suppression devices and techniques. 4. When located adjacent to existing or planned noise sensitive residential and public/quasi-public land uses, non-residential land uses should mitigate noise generation to meet the 55 DNL guideline at the property line. 5. Noise studies should be required for land use proposals where known or suspected peak event noise sources occur which may

---

[3] CNEL (Community Noise Equivalent Level): The CNEL is similar to the L_{dn} described above, but with an additional 5 dBA "penalty" added to noise events that occur during the noise-sensitive hours between 7 pm to 10 pm, which are typically reserved for relaxation, conversation, reading, and television. If using the same 24-hour noise data, the reported CNEL is typically approximately 0.5 dBA higher than the L_{dn}.

Table 3.9-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
	impact adjacent existing or planned land uses. Chapter 20 of the City of San Jose Municipal Code provides exterior noise standards for specific land use districts. Noise level standards vary from a maximum noise level of 55 (e.g., residential) to 70 dBA (e.g., industrial or open space next to industrial uses) unless a conditional use permit is granted. The Municipal Code also states that there shall be no activity on any site that causes ground vibration that is perceptible without instruments at the property line of the site. The Municipal Code does not specifically call out noise exemptions for construction activities (City of San Jose, 2004). Table 3.9-8 shows the specific performance standards that may be applied at the varying land use property lines.

Table 3.9-2 Summary of Noise Levels Identified as Requisite to Protect the Public Health and Welfare with an Adequate Margin Of Safety

Effect	Level dBA[1]	Activity Area
Hearing Loss	70 L_{eq} (24-hour)	All Areas
Outdoor Activity Interference and Annoyance	55 L_{dn}[2]	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use
	55 L_{eq} (24-hour)[3]	Outdoor areas where people spend limited amounts of time (e.g., school yards, playgrounds)
Indoor Activity Interference and Annoyance	45 L_{dn}[2]	Indoor residential areas
	45 L_{eq} (24-hour)[3]	Other indoor areas with human activities (e.g., schools yards playgrounds)

[1] A-weighted decibel (dBA) is a measure on a logarithmic scale that indicates the squared ratio of sound pressure to a reference sound pressure. A-weighted (A) refers to the specific frequency-dependent rating scale that is used to approximate human response.

[2] Day-night level (L_{dn}) is the energy-average of the A-weighted noise levels during a 24-hour period with 10 dBA added to the night (10 p.m.–7 a.m.) hours.

[3] Equivalent noise level (L_{eq}) is the energy mean (average) noise level. The instantaneous noise levels during a specific period of time (e.g., 24-hour) in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value is calculated, which is then converted back to dBA to determine the L_{eq}.

Source: EPA 1974

Table 3.9-3 Summary of Noise Abatement Criteria

Activity Area Category	L_{eq} (1-hour) dBA	Description of Activity Area Category
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals
C	72 (exterior)	Developed lands, properties, or activities not included in Categories A or B above
D	-	Undeveloped lands
E	52 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

Notes: dBA = A-weighted decibels; L_{eq} = energy mean (average) noise level
Source: FHWA 2006

Table 3.9-4 Summary of Recommended Exceedance Levels for Major Construction Projects with Adjacent Noise-Sensitive Receptors

Land Use	L_{eq} (8-Hour) dBA		L_{dn} (30-Day Average) dBA
	Day	Night	
Residential	80	70	75

Notes: dBA = A-weighted decibels; L_{dn} = day-night average noise level; L_{eq} = energy mean (average) noise level
Source: FTA 2006

Table 3.9-5 Summary of Land Use Noise Compatibility Guidelines

Land Use Category	Community Noise Exposure (dBA L_{dn})			
	Normally Acceptable[1]	Conditionally Acceptable[2]	Normally Unacceptable[3]	Clearly Unacceptable[4]
Residential—Low-Density Single-Family, Duplex, Mobile Home	<60	55–70	70–75	75+
Residential—Multifamily	<65	60–70	70–75	75+
Transient Lodging—Motel, Hotel	<65	60–70	70–80	80+
Schools, Libraries, Churches, Hospitals, Nursing Homes	<70	60–70	70–80	80+
Auditoriums, Concert Halls, Amphitheaters		<70	65+	
Sports Arena, Outdoor Spectator Sports		<75	70+	
Playgrounds, Neighborhood Parks	<70		67.5–75	72.5+
Golf Courses, Riding Stables, Water Recreation, Cemeteries	<75		70–80	80+
Office Building, Business Commercial, and Professional	<70	67.5–77.5	75+	
Industrial, Manufacturing, Utilities, Agriculture	<75	70–80	75+	

Notes: dBA = A-weighted decibels; L_{dn} = day-night average noise level

[1] Specified land use is satisfactory, based on the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

[2] New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.

[3] New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Outdoor areas must be shielded.

[4] New construction or development should generally not be undertaken.

Source: OPR 2003

3.9.2 Physical Setting

Acoustic Fundamentals

Noise is generally defined as sound that is loud, disagreeable, unexpected, or unwanted. Sound, as described in more detail below, is mechanical energy transmitted in the form of a wave because of a disturbance or vibration, and as any pressure variation in air that the human ear can detect.

Sound Properties

A sound wave is introduced into a medium (air) by a vibrating object. The vibrating object (e.g., vocal chords, the string, and sound board of a guitar or the diaphragm of a radio speaker) is the source of the disturbance that moves through the medium. Regardless of the type of source creating the sound wave, the particles of the medium through which the sound moves are vibrating in a back-and-forth motion at a given frequency (pitch). The frequency of a wave refers to how often the particles vibrate when a wave passes through the medium. The frequency of a wave is measured as the number of complete back-and-forth vibrations of a particle per unit of time. If a particle of air undergoes 1,000 longitudinal vibrations in two seconds, then the frequency of the wave would be 500 vibrations per second. A commonly used unit for frequency is cycles per second, called hertz (Hz).

Each particle vibrates as a result of the motion of its nearest neighbor. For example, the first particle of the medium begins vibrating at 500 Hz and sets the second particle of the medium into motion at the same frequency (500 Hz). The second particle begins vibrating at 500 Hz and thus sets the third particle into motion at 500 Hz. The process continues throughout the medium; hence, each particle vibrates at the same frequency, which is the frequency of the original source. Subsequently, a guitar string vibrating at 500 Hz will set the air particles in the room vibrating at the same frequency (500 Hz), which carries a sound signal to the ear of a listener that is detected as a 500 Hz sound wave.

The back-and-forth vibration motion of the particles of the medium would not be the only observable phenomenon occurring at a given frequency. Because a sound wave is a pressure wave, a detector could be used to detect oscillations in pressure from high to low and back to high pressure. As the compression (high-pressure) and rarefaction (low-pressure) disturbances move through the medium, they would reach the detector at a given frequency. For example, a compression would reach the detector 500 times per second if the frequency of the wave were 500 Hz. Similarly, a rarefaction would reach the detector 500 times per second if the frequency of the wave were 500 Hz. Thus, the frequency of a sound wave refers not only to the number of back-and-forth vibrations of the particles per unit of time but also to the number of compression or rarefaction disturbances that pass a given point per unit of time. A detector could be used to detect the frequency of these pressure oscillations over a given period of time. The period of the sound wave can be found by measuring the time between successive high-pressure points (corresponding to the compressions) or the time between successive low-pressure points (corresponding to the rarefactions). The frequency is simply the reciprocal of the period; thus an inverse relationship exists so that as frequency increases, the period decreases, and vice versa.

A wave is an energy transport phenomenon that transports energy along a medium. The amount of energy carried by a wave is related to the amplitude (loudness) of the wave. A high-energy wave is characterized by high amplitude; a low-energy wave is characterized by low amplitude. The amplitude of a wave refers to the maximum amount of displacement of a particle from its rest position. The energy transported by a wave is directly proportional to the square of the amplitude of the wave. This means that a doubling of the amplitude of a wave is indicative of a quadrupling of the energy transported by the wave.

Sound and the Human Ear

Because of the ability of the human ear to detect a wide range of sound-pressure fluctuations, sound-pressure levels are expressed in logarithmic units called decibels (dB) to avoid a very large and awkward range in numbers. The sound-pressure level in decibels is calculated by taking the log of the ratio between the actual sound pressure and the reference sound pressure squared. The reference sound pressure is considered the absolute hearing threshold (California Department of Transportation 1998). Use of this logarithmic scale reveals that the total sound from two individual 65 dBA sources is 68 dBA, not 130 dBA (i.e., doubling the source strength increases the sound pressure by three dBA).

Because the human ear is not equally sensitive to all sound frequencies, a specific frequency-dependent rating scale was devised to relate noise to human sensitivity. An A-weighted dB (dBA) scale performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear. The basis for compensation is the faintest sound audible to the average ear at the frequency of maximum sensitivity. This dBA scale is used by most authorities to regulate environmental noise. Typical indoor and outdoor noise levels are presented in Figure 3.9-1 using this scale.

With respect to how humans perceive and react to changes in noise levels, a 1 dBA increase is imperceptible, a 3 dBA increase is barely perceptible, a 6 dBA increase is clearly noticeable, and a 10 dBA increase is subjectively perceived as approximately twice as loud (Egan 1988), as presented in Table 3.9-1. Table 3.9-6 was developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broad-band noise and to changes in levels of a given noise source. It is probably most applicable to noise levels in the range of 50 to 70 dBA, as this is the usual range of voice and interior noise levels.

Table 3.9-6 Subjective Reaction to Changes in Noise Levels of Similar Sources

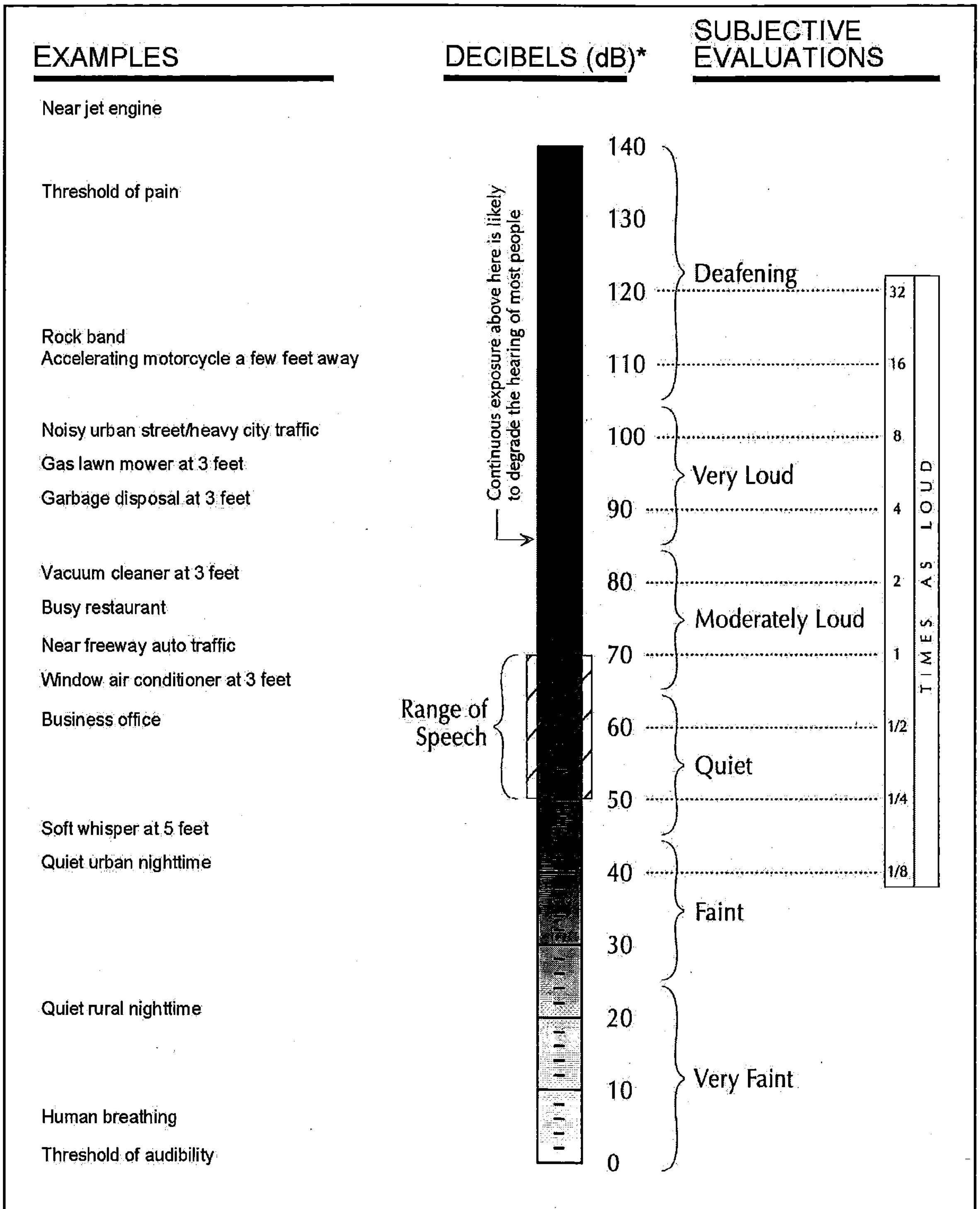
Change in Level, dBA	Subjective Reaction	Factor Change in Acoustical Energy
1	Imperceptible (Except for Tones)	1.3
3	Just Barely Perceptible	2.0
6	Clearly Noticeable	4.0
10	About Twice (or Half) as Loud	10.0

Note: dBA = A-weighted decibels
Source: Egan 1988

Sound Propagation and Attenuation

As sound (noise) propagates from the source to the receptor, the attenuation, or manner of noise reduction in relation to distance, is dependent on surface characteristics, atmospheric conditions, and the presence of physical barriers. The inverse-square law describes the attenuation caused by the pattern in which sound travels from the source to receptor. Sound travels uniformly outward from a point source in a spherical pattern with an attenuation rate of six dBA per doubling of distance (dBA/DD). However, from

Figure 3.9-1 Typical Noise Levels



* dB are "average" values as measured on the A-scale of a sound-level meter.
From Concepts in Architectural Acoustics: M. David Egan, McGraw Hill, 1972 and U.S. Department of Housing and Urban Development, Office of Community Planning and Development "The Noise Guidebook."

Source: Data compiled by EDAW in 2006

a line source (e.g., a road), sound travels uniformly outward in a cylindrical pattern with an attenuation rate of three dBA/DD. The surface characteristics between the source and the receptor may result in additional sound absorption and/or reflection. Atmospheric conditions such as wind speed, temperature, and humidity may affect noise levels.

Furthermore, the presence of a barrier between the source and the receptor may also attenuate noise levels. The actual amount of attenuation is dependent upon the size of the barrier and the frequency of the noise. A noise barrier may be any natural or human-made feature such as a hill, tree, building, wall, or berm (California Department of Transportation 1998).

All buildings provide some exterior-to-interior noise reduction. A building constructed with a wood frame and a stucco or wood sheathing exterior typically provides a minimum exterior-to-interior noise reduction of 25 dBA with its windows closed, whereas a building constructed of a steel or concrete frame, a curtain wall or masonry exterior wall, and fixed plate glass windows of one-quarter-inch thickness typically provides an exterior-to-interior noise reduction of 30 to 40 dBA with its windows closed (Paul S. Veneklasen & Associates 1973, cited in California Department of Transportation 2002).

Noise Descriptors

The selection of a proper noise descriptor for a specific source is dependent upon the spatial and temporal distribution, duration, and fluctuation of the noise. The noise descriptors most often encountered when dealing with traffic, community, and environmental noise are defined below (California Department of Transportation 1998, Lipscomb and Taylor 1978).

- L_{max} (Maximum Noise Level): The maximum instantaneous noise level during a specific period of time. The L_{max} may also be referred to as the "peak (noise) level;"
- L_{min} (Minimum Noise Level): The minimum instantaneous noise level during a specific period of time;
- L_x (Statistical Descriptor): The noise level exceeded X percent of a specific period of time;
- L_{eq} (Equivalent Noise Level): The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value is calculated, which is then converted back to dBA to determine the L_{eq}. In noise environments determined by major noise events, such as aircraft overflights, the L_{eq} value is heavily influenced by the magnitude and number of single events that produce the high noise levels;
- L_{dn} or DNL (Day-Night Noise Level): The 24-hour L_{eq} with a 10 dBA "penalty" for noise events that occur during the noise-sensitive hours between 10 p.m. and 7 a.m. In other words, 10 dBA is "added" to noise events that occur in the nighttime hours, and this generates a higher reported noise level when determining compliance with noise standards. The L_{dn} attempts to account for the fact that noise during this specific period of time is a potential source of disturbance with respect to normal sleeping hours;
- CNEL (Community Noise Equivalent Level): The CNEL is similar to the L_{dn} described above, but with an additional five dBA "penalty" added to noise events that occur during the noise-sensitive hours between 7 p.m. to 10 p.m., which are typically reserved for relaxation, conversation, reading, and television. If using the same 24-hour noise data, the reported CNEL is typically approximately 0.5 dBA higher than the L_{dn}; and

- SENL (Single Event [Impulsive] Noise Level): The SENL describes a receiver's cumulative noise exposure from a single impulsive noise event, which is defined as an acoustical event of short duration and involves a change in sound pressure above some reference value. SENLs typically represent the noise events used to calculate the L_{eq}, L_{dn}, and CNEL.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level L_{eq}, which corresponds to a steady-state A-weighted sound level containing the same total energy as a time-varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptors such as L_{dn} and CNEL, as defined above, and shows very good correlation with community response to noise.

Negative Effects of Noise on Humans

Negative effects of noise exposure include physical damage to the human auditory system, interference, and disease. Exposure to noise may result in physical damage to the auditory system, which may lead to gradual or traumatic hearing loss. Gradual hearing loss is caused by sustained exposure to moderately high noise levels over a period of time; traumatic hearing loss is caused by sudden exposure to extremely high noise levels over a short period. Gradual and traumatic hearing loss may both result in permanent hearing damage. In addition, noise may interfere with or interrupt sleep, relaxation, recreation, and communication. Although most interference may be classified as annoying, the inability to hear a warning signal may be considered dangerous. Noise may also be a contributor to diseases associated with stress, such as hypertension, anxiety, and heart disease. The degree to which noise contributes to such diseases depends on the frequency, bandwidth, and level of the noise, and the exposure time (California Department of Transportation 1998).

Vibration. Vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure borne noise. Sources of groundborne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, groundborne vibrations may be described by amplitude and frequency.

Vibration amplitudes are usually expressed in PPV or RMS, as in RMS vibration velocity. The PPV and RMS velocity are normally described in inches per second (in/sec). PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is often used in monitoring of blasting vibration because it is related to the stresses that are experienced by buildings (FHWA 2006, California Department of Transportation 2002).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. It takes some time for the human body to respond to vibration signals. In a sense, the human body responds to average vibration amplitude. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a one second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as VdB, which serves to compress the range of numbers required to describe vibration (FHWA 2006). This is based on a reference value of one microinch per second (μin/sec).

The background vibration-velocity level in residential areas is usually approximately 50 VdB. Groundborne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels (FHWA 2006).

Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Construction activities can generate groundborne vibrations, which can pose a risk to nearby structures. Constant or transient vibrations can weaken structures, crack facades, and disturb occupants (FHWA 2006).

Construction vibrations can be transient, random, or continuous. Transient construction vibrations are generated by blasting, impact pile driving, and wrecking balls. Continuous vibrations result from vibratory piledrivers, large pumps, horizontal directional drilling, and compressors. Random vibration can result from jackhammers, pavement breakers, and heavy construction equipment. Table 3.9-7 describes the general human response to different levels of groundborne vibration-velocity levels.

Table 3.9-7 Human Response to Different Levels of Groundborne Noise and Vibration

Vibration-Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.

Notes: VdB = vibration decibels referenced to one μinch/second and based on the root mean square (RMS) velocity amplitude.
Source: FHWA 2006

Regional

The Alviso Slough Restoration Project is located north of downtown San Jose, within its the city limits. The proposed project would remove vegetation and root mass (from Gold Street Bridge to Alviso Marina County Park) to a depth of at least four feet on either side of the slough and involve dredging in the slough. The noise environment in Alviso includes transportation and non-transportation noise sources. The major transportation noise sources include State Route (SR) 237 and U.S. 101, the UPRR, San Jose international Airport and Moffett Field Naval Air Station. The major non-transportation noise sources include agricultural uses, and light industrial uses (e.g., automotive repair, freight yards, welding, and steel fabrication).

Table 3.9-8 City of San Jose Performance Standards (Chapter 20 of the City of San Jose Municipal Code Tables 20-45, 85, 105, 135)

Land Use Adjacent to:	Maximum Noise Level in Decibels at Property Line
Open space or agricultural use adjacent to a property used or zoned for residential purposes	55
Open Space or agricultural use adjacent to a property used or zoned for commercial purposes	60
Open Space or agricultural use adjacent to a property used or zoned for industrial or use other than commercial or residential purposes	70
Any residential or non-residential use	55
Commercial use adjacent to a property used or zoned for residential purposes	55
Commercial use adjacent to a property used or zoned for commercial or other non-residential purposes	60
Industrial use adjacent to a property used or zoned for residential purposes	55
Industrial use adjacent to a property used or zoned for commercial purposes	60
Industrial use adjacent to a property used or zoned for industrial or use other than commercial or residential	70

Source: Chapter 20 of the City of San Jose Municipal Code

Project Area

The Alviso Slough is situated adjacent to the community of Alviso, within the San Jose City limits, and in close proximity to a myriad of land uses (residential, commercial, industrial, and public/quasi public land uses). The noise environment within the Project area also includes transportation and non-transportation noise sources. Non-transportation noise sources include office uses (Foundry Network and Tivo Inc.), commercial uses, industrial uses (Zanker Road Landfill), agricultural uses and rural residential activities. Noise from surrounding operations (e.g., light industrial) in addition to noise from outdoor activities (e.g., people talking, dogs barking, operation of landscaping and agricultural equipment) also contributes, to a lesser extent, to the existing noise environment. Transportation noise sources include SR 237, U.S. 101, I-880, and Gold Street. Moffett Field Naval Air Station is located approximately 3.8 miles to the southwest of the Project area and San Jose International is located approximately five miles to the southeast.

3.9.3 Environmental Impacts and Mitigation

Overview

This section provides an analysis of all potential impacts within the existing noise environment due to implementation of the proposed project alternative components/activities as well as the criteria used to determine significance.

Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, a significant noise impact would occur if the Project would:

- Expose persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Expose persons to or generation of excessive groundborne vibration or groundborne noise levels;
- Result in a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project;
- Result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity due to construction activities; or
- Expose people residing or working in the Project area to excessive aircraft–generated noise levels.

The quantitative noise standard is dependent upon the local jurisdiction (City of San Jose) where activities would occur (see Section 3.9.1 above), and are discussed below in relation to the Alviso Slough Restoration Project. For the purposes of this analysis, an increase of three dBA or more to the existing noise environment will be considered significant.

Impacts and Mitigation

The impacts analysis in this ~~Draft~~ Final EIR evaluates five action alternatives and the required No Project alternative. The action alternatives include vegetation removal and/or dredging, as described in Chapter 2. Under the No Project alternative, the District would not take any action in the Project area and existing programs would continue. The analysis covers impacts from the construction and maintenance phases–both in the slough and at staging areas.

All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by BCDC, CSLC, the District, or SBYC by the time of commencement of construction of this Project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Table 3.9-9 lists each impact identified for the proposed Project, along with the significance of each impact. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (adverse, but less than significant), or Class IV (beneficial). Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections.

The Alviso Slough Restoration Project area is not in an area with excessive aircraft-generated noise levels. Therefore the Project would not expose people residing or working in the Project area to excessive aircraft-generated noise levels.

Table 3.9-9 Impact and Mitigation Summary

Impact	Impact Significance	Mitigation Measures
Impact NOI-1: On-Site, Off-Road, Heavy-Duty Equipment Noise Levels: (i) Construction: vegetation removal, dredging, and hauling. (ii) Construction: pile driving for pier installation.	(i) Alts. 1-5: Class II (ii) Alts. 1-5: Class I	NOI-A NOI-B
	Alt. 6: No Impact	--
Impact NOI-2: Off-Site, On-Road Vehicle Noise.	Alts. 1-5: Class II	~~NOI-C~~ NOI-A
	Alt. 6: No Impact	--
Impact NOI-3: Exposure to Groundborne Vibration.	Alts. 1-5: Class I	NOI-D
	Alt. 6: No Impact	--
Note: The impacts and mitigation would be the same both with and without the SBSP Restoration Project.		

Vegetation Removal and Dredging Best Management Practices

Vegetation removal and dredging impacts to the noise environment would be minimized through the use of relevant standard BMPs (as appropriate) that have been described in the District BMP Handbook (SCVWD 2006) as part of the proposed project including the following:

- In general, work will be conducted during normal working hours. Extending weekday hours and working weekends may be necessary to complete the project;
- Internal combustion engines will be equipped with adequate mufflers;
- Excessive idling of vehicles will be prohibited;
- All construction equipment will be equipped with manufacture's standard noise control devices;
- The arrival and departure of trucks hauling material will be limited to the hours of construction; and
- The use of jake brakes is prohibited in residential areas.

Impact NOI-1: On-Site, Off-Road, Heavy-Duty Equipment Noise Levels.

On-site, off-road, heavy-duty equipment noise levels could exceed exterior noise standards established by the City of San Jose for non-transportation sources of noise (Table 3.9-7) or result in a noticeable increase in ambient noise levels at existing nearby off-site sensitive land uses.

Summary - Common to all Alternatives

Noise impacts depend on the type of activity, the equipment used, and the distance to sensitive receptors. A discussion of the typical construction equipment that may be used and their associated noise levels, the distances of Alviso Slough Restoration Project from sensitive receptors, and projected noise levels at the sensitive receptors from construction and operation of the Project are presented below. The proposed restoration project includes initial construction activities and maintenance activities. These activities would require similar equipment lists and would be conducted in similar proximity to sensitive receptors.

Initial Construction-Related Activities

In general, initial construction-related activities would include excavation, material transport, dredging and other miscellaneous activities (using both land- and water-based equipment). On-site off-road construction equipment would likely include roto-tillers, weed eaters, mowers, front-end loader, and haul trucks. Water-based equipment may include an Aquamog, or small barges, with hydraulic bucket dredges and aquatic harvestors. According to the U.S. EPA, noise levels for typical construction equipment range from 75 to 91 dBA at 50 ft (15 m) without feasible control measures, as indicated in Table 3.9-10 (pile driving is discussed below).

Table 3.9-10 Typical Construction-Equipment Noise Levels for Various Types of Equipment

Type of Equipment	Noise Level in dBA at 50 Feet	
	Without Feasible Noise Control	With Feasible Noise Control[1]
Dozer or Tractor	85	75
Front-end Loader	85	75
Excavator	85	75
Truck	91	75
Aquamog	85[2]	78
Harvester	85[2]	78
Pile Driver	101	95

[1] Feasible noise control includes the use of intake mufflers, exhaust mufflers, and engine shrouds in accordance with manufacturers' specifications.
[2] An assumed reference noise level based upon similar operational characteristics of a crane.
Source: U.S. EPA 1971, FTA 1995, FHWA 2006.

A reference noise level for the proposed use of an Aquamog is not available at this time. The Aquamog is an aquatic-based heavy construction equipment. It could operate an auger head, clam rake, claim bucket, roto-tiller, flail chopper, T-bar cutter, along with a hydraulic arm for extending attachment pieces, and paddle wheels that maintain the position of the Aquamog during operation. Based on the components and use of the Aquamog, it closely resembles the noise characteristics of a crane. Therefore, it is assumed that a reference noise level of 85 dBA at 50 feet is conservative for this analysis. It should be noted that an Aquamog owner and operator stated that noise measurements conducted for a previous project resulted in Aquamog noise levels of 75 dBA at 100 feet (Forni, pers. comms., 2004). In order to remain conservative, the reference noise level assumed in this analysis for the aquatic harvester to be operated in conjunction with the Aquamog, would also be 85 dBA at 50 feet.

Project activities would occur along the slough between Gold Street Bridge and Alviso Marina County Park. The sensitive receptor areas closest to Alviso Slough where construction activities would be conducted, were determined based upon aerial maps and Figure 4 of the Alviso Master Plan (City of San Jose, 1994). The approximate distance at which to apply the applicable noise standards was determined using aerials as well.

Table 3.9-11 shows the noise levels associated with proposed project construction noise. Predicted construction noise levels within the Alviso Slough are at a reference distance of 100 feet. Predicted noise levels assume the operation of one of each individual construction components. Construction noise level calculations are based upon the reference noise levels shown in Table 3.9-11. The construction noise level prediction assumes flat conditions and does not account for shielding provided by intervening structures. A complete listing of construction noise prediction inputs and results are shown in Appendix E.

Table 3.9-11 Predicted Construction Noise Levels

Distance to Nearest Receptors (feet)	Exterior dBA L_{eq}	Land Use	Performance Standard
	Unmitigated[1,2]		
South Bay Yacht Club (125 feet)	65.6	Commercial	60 dBA
Union Warehouse and Docks (200 feet)	61.5	Industrial	70 dBA
Wade's Warehouse (415 feet)	55.2	Industrial	70 dBA
Summerset Mobile Estates (400 feet)	55.5	Residential	55 dBA

[1] Predicted project-generated, restoration-related noise levels include the following sources: loader, dozer, excavator, truck, Aguamog, and harvester.

[2] Predicted levels only account for reductions from the following: equipment properly maintained and equipped with noise control devices.

Refer to Appendix E for noise modeling input assumptions and output results.

Source: Modeling conducted by EDAW in 2007

The receptors shown in Table 3.9-11 are within the first row of receptors and the Summerset Mobile Estates represent the nearest noise-sensitive receptors. It is assumed that the second row of receptors would benefit from shielding provided by intervening structures, resulting in noise levels compatible with the performance standards shown in Table 3.9-7 (Caltrans 1998). As shown, construction-related noise levels would exceed relevant noise standards. Construction noise due to the proposed project would be in compliance with the City of San Jose Municipal Code maximum exterior noise level standard of 55 dBA at 425 feet from the center of construction activity. A complete list of assumptions and inputs are shown in Appendix E.

Maintenance-Related Activities

Maintenance would be required every three to five years to maintain the desired slough condition. Maintenance noise associated with the proposed project includes the use of the similar on-site, off-road, heavy duty equipment (loaders, excavators, aquamogs, harvestors, and haul trucks). The activities associated with this equipment include vegetation removal, dredging, collection of debris, and hauling of debris. Noise levels are expected to be similar to the noise levels discussed with initial construction activities. It is assumed that the noise levels shown in Table 3.9-11 would also apply to maintenance activities.

Pile Driving Related Activities

If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work. Noise issues associated with replacing the docks would include demolition, pile driving, and new construction of the docks. Replacing the docks may also expose nearby receptors to elevated vibration levels due to pile driving and will be discussed later.

On-site, off-road, heavy-duty equipment noise levels attributable to SBYC dock/pier demolition and reconstruction may still exceed the standards established by the City of San Jose (Table 3.9-7). For instance, a pile driver properly fitted with feasible noise controls would generate approximately 83 dBA at a distance of 200 feet.

Excavation-Related Activities Associated with Mitigation Measures HYD-A and HYD-E

Activities associated with the lowering of the weir and flood protection improvements (e.g., grading, armoring) as proposed in Mitigation Measures HYD-A and HYD-E, respectively (see Section 3.1, Hydrology and Geomorphology), would also result in similar construction noise impacts as described above for initial construction-related activities as similar equipment would be used.

Alternatives 1, 2, 3, 4, and 5

Initial construction, maintenance, and pile-driving related noise impacts to the noise environment within the community of Alviso would be minimized with implementation of BMPs; however, the potential for increased noise levels within the community would still exist. The impact conclusions would apply to Alternatives 1 through 5 and would be reoccurring when maintenance is required (estimated at every three to five years). Those alternatives with the largest footprint would have the greatest impact. It is assumed that existing community noise levels would increase by three dBA or more due to the project. Based upon the CEQA significance criteria above (an increase of three dBA or more to the existing noise environment), this would result in a significant impact. Additionally, Alternatives 3, 4, and 5, which include dredging components (in addition to vegetation removal, which is common to all alternatives), would be considered to have an increased level of impact. Additionally, Alternatives 3, 4, and 5 would utilize increased numbers of heavy construction equipment and extend the number of days that construction activities would occur. However, impacts would be considered **Less than Significant with Mitigation.**

- **Mitigation Measure NOI-A: Manage Construction Noise.**
  - Construction equipment shall be properly maintained and equipped with noise controls, such as mufflers, in accordance with manufacturers' specifications. Equipment shall be inspected by Caltrans or a certified heavy equipment mechanic. A detailed list of on-site heavy equipment shall be compiled with noise control devices called out for each individual piece of heavy equipment. The inspection findings shall be presented in report format outlining existing control devices and noise control devices required to comply with this mitigation measure. Inspections shall be conducted prior to commencement of construction activities for each construction season with additional inspections to be conducted mid way through the construction season.
  - All construction operations associated with the Project shall be limited to the hours of 8 a.m. to 5 p.m. Monday though Friday (or as prescribed by the City of San Jose), during which time such activities would have the least potential for annoyance or sleep disturbance.
  - Noise level measurements shall be conducted at sensitive receptor locations during construction activities to ensure compliance with the performance standards specified in Table 3.9-7. Noise level measurements shall be conducted by a qualified acoustical consultant during the first week of construction activities, specifically while Aquamogs, harvestors, front-end loaders, and haul trucks are operating during a typical work day. Additional noise level measurements shall be conducted prior to commencement of construction activities for each construction season with additional inspections to be

conducted mid way through the construction season. If construction activities as measured exceed the City of San Jose Municipal Code for maximum exterior noise levels, the mitigation measures below shall be included as part of the project.

- The initial construction activities shall not be conducted within 425 (distance to the 55 dBA contour due to proposed project construction noise as shown in Appendix E) feet of any noise-sensitive receptor without the use of a temporary barrier. Provided that a temporary barrier is constructed, it would be required to be constructed in accordance with the following specifications:
    - The barrier shall be placed as close to the noise source or as close to the receptor as possible and shall break the line of sight between the source and receptor.
    - The barrier shall be 6 feet in height or break line of sight from receptor to source and shall extend 12 feet past the noise sensitive land uses, north and south, in order to reduce noise flanking around the barrier. Specifically, the construction area north and south of the SBYC and the land use located at the corner of Taylor and Hope Streets.
    - The barrier shall be constructed of ¾-inch Medium Density Overlay (MDO) plywood sheeting, or other acceptable material having a surface weight of two pounds per square foot (lb/sq.ft.) or greater, and a demonstrated Sound Transmission Class (STC) rating of 25 or greater as defined by the American Society for Testing and Materials (ASTM) Test Method E90.
    - For a temporary acoustical curtain, the material shall be weather and abuse resistance, and exhibit superior hanging and tear strength during construction and with a surface weight of at least one lb/sq.ft. The material shall have a minimum breaking strength of 120 pounds per inch (lb/in) per Federal Test Method Standard (FTMS) 191 A-M5102 and minimum tear strength of 30 lb/in per ASTM D117. Based on the same test procedures, the absorptive material facing shall have a minimum breaking strength of 100 lb/in and minimum tear strength of 7 lb/in. The material shall have a STC rating of 25 or greater, based on certified sound transmission loss data taken according to ASTM Test Method E90. It shall also have a Noise Reduction Coefficient (NRC) rating of 0.70 or greater, based on certified sound absorption coefficient data according to ASTM Test Method C423.
    - When barrier units are joined together, the mating surfaces of the barrier sides shall be flush with each other. Gaps between barrier units, and between the bottom edge of the barrier panels and the ground, shall be closed with material that will completely close the gaps, and be dense enough to attenuate noise.

The implementation of the above mitigation measure would result in noise levels in compliance with the performance standards shown in Table 3.9-11 for residential, commercial, and industrial land uses during the bulk of the construction phase (Aquamogs in the slough, trucking). However, the mitigation above would not alleviate the noise impacts resulting from the temporary pile driving that may be required to install the piers for the SBYC docks, if determined necessary. Therefore, additional mitigation measures are proposed during pile driving activities.

- **Mitigation Measure NOI-B: Manage Pile Driving Noise.**
  - Holes shall be predrilled to the maximum feasible depth. This predrilling will reduce the number of blows required to seat the pile, and will concentrate the pile-driving activity closer to the ground where noise can be attenuated more effectively.
  - A noise disturbance coordinator shall be designated, and this person's telephone number shall be conspicuously posted around the project site and in adjacent public spaces. The noise disturbance coordinator shall receive all public complaints about construction-related noise and vibration, shall be responsible for determining the cause of the complaint, and shall implement any feasible measures (e.g., sensitive receptor façade upgrades, such as window package) to be taken to alleviate the problem. Complaints received shall be compiled in a monthly report outlining the nature of the complaint, the complainant, and location of disturbance, to be filed with the District.

Implementation of mitigation measures NOI-A and NOI-B would only reduce noise levels by 5-10 dBA. This would not be in compliance with applicable noise standards, therefore, this impact relating to pier demolition and pile driving would remain **Significant and Unavoidable**.

Alternative 6: No Project

- Alternative 6 would not result in any elevated noise levels within the community; there would be **No Impact** and no mitigation would be necessary.

Impact NOI-2: **Off-Site, On-Road Vehicle Noise.**

The project would expose existing sensitive receptors to project-generated, off-site, on road vehicle noise levels. Haul truck and crew vehicle-generated noise levels could exceed exterior noise standards established by the City of San Jose for transportation sources of noise (60 dB DNL) or result in a noticeable increase in ambient noise levels at existing nearby off-site sensitive land uses.

Summary - Common to all Alternatives

Off-site, on-road vehicle noise would be considered significant if changes in noise levels exceed three dBA on any roadway from project-generated traffic, or if worst-case noise levels from heavy-duty truck and crew vehicle travel on proposed haul routes exceed the applicable transportation noise source standard of 60 dB DNL at existing nearby sensitive receptors. Existing noise-sensitive receptors are located along haul truck routes as indicated in Section 3.13, Transportation and Circulation. This analysis will represent the noise levels associated with off-site, on-road vehicle noise only, and its~~it's~~ potential to exceed local noise standards. A complete listing of off-site, on road vehicle noise model inputs and results are shown in Appendix E.

Alternatives 1, 2, 3, 4, and 5 (Initial Construction-Related Activities)

The number of off-site, on-road vehicle trips would vary between Alternatives 1 and 2 and Alternatives 3, 4, and 5. For this analysis the most conservative number of off-site, on-road vehicle trips (maximum of 160 one-way haul truck trips and 40 employee trips for Alternatives 3, 4, and 5) identified in Section 2.5.2, Construction Sequencing, was used. The FHWA Traffic Noise Prediction Model (FHWA 1988) was used to calculate off-site, on-road vehicle trips noise levels along affected roadways. The project's contribution to the existing traffic noise levels along area roadways could not be determined. Predicted off-site, on-road vehicle noise levels were calculated assuming a noise reduction of three dBA per doubling of distance from the source, flat conditions, and does not account for shielding that may be provided by intervening building facades. Vehicle distribution percentages were calculated based on the number of haul truck and crew vehicle trips.

Noise levels were calculated at 25 mph and 35 mph and the distribution was weighted to reflect typical hours of operation, daytime hours. Based on the FHWA modeled results, off-site, on-road vehicle trips would contribute approximately 56.4 dBA DNL and 58.5 dBA DNL at 25 mph and 35 mph, respectively, to the existing traffic noise levels on collector roadways.

The off-site, on-road vehicle trips for SR 237 and I-880 would not affect noise levels for these roadways. Generally, a doubling in traffic volume would result in a three dB increase in traffic noise levels. Current average daily traffic volumes for SR 237 and I-880 are 88,000 and 173,000 vehicles trips, respectively (Caltrans 2006).

Project related off-site, on-road vehicle noise would not exceed the City of San Jose's 60 DNL exterior noise level standard. ~~Because the potential for a three dB increase in local traffic noise levels due to the project may still exist, the project contribution would be considerable. This impact would be considered **Significant and Unavoidable**.~~ Because the off-site on-road activities would not exceed the noise level standard, no significant impacts are foreseen with implementation of Mitigation Measure NOI-A.
Alternatives 1, 2, 3, 4, and 5 (Maintenance-Related Activities)

Maintenance would be required every three to five years to maintain the desired slough condition. Maintenance activities associated with the proposed project includes similar off-site, on-road vehicle noise associated with haul trucks and crew vehicles under initial construction activities. Therefore, noise levels are expected to be similar to the noise levels discussed above for initial construction activities.

This impact would remain **Significant and Unavoidable,** after implementation of the following measure:

- **Mitigation Measure NOI-C: Manage Off-Site, On-Road Vehicle Noise.**
  - All heavy trucks shall be equipped with noise control (e.g., mufflers) devices in accordance with manufacturers' specifications.
  - ~~All heavy trucks shall be inspected periodically to ensure proper maintenance and presence of noise control devices (e.g., lubrication, non-leaking mufflers, and shrouding).~~
  - All heavy trucks should maintain travel speeds of 25 mph along roadways with adjacent noise-sensitive receptors in the community of Alviso.

Alternative 6: No Project

Alternative 6 would not result in any elevated traffic noise levels along local roadways; there would be **No Impact** and no mitigation would be necessary.

Impact NOI-3: **Exposure to Groundborne Vibration.**

Operation of heavy-duty construction equipment could temporarily generate high levels of groundborne vibration that would exceed the human response–based thresholds of the FTA. In addition, pile-driving activity (several days) could generate vibration levels that exceed Caltrans's structural damage–based thresholds at nearby existing structures.

Summary - Common to all Alternatives

Construction activities have the potential to result in varying degrees of temporary ground vibration, depending on the specific construction equipment used and operations involved. Vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. Table 3.9-11 displays vibration levels for typical construction equipment.

Table 3.9-12 Typical Construction Equipment Vibration Levels

Equipment		PPV at 25 feet (in/sec)[1]	Approximate Lv at 25 feet[2]
Pile driver (impact)	Upper range	1.518	112
	Typical	0.644	104
Pile driver (sonic)	Upper range	0.734	105
	Typical	0.170	93
Large bulldozer		0.089	87
Trucks		0.076	86
Small bulldozer		0.003	58

[1] Where PPV is the peak particle velocity

[2] Where Lv is the velocity level in decibels and based on the root mean square velocity amplitude.

Source: FTA 2006

On-site construction equipment for the removal of abandoned vessels, unused docks, and sunken vessels or debris, and reinstallation of damaged or displaced active piers from vegetation and root mass removal may include various trucks, pile drivers, excavators, backhoes, bulldozers, loaders, and compactors. With the exception of pile driving, the most intense generation of ground vibration would be associated with large bulldozers that generated levels of 0.089 in/sec PPV and 87 VdB. These levels would attenuate to 0.031 in/sec PPV or 78 VdB at a distance of 50 feet. Because there are no residential buildings within 50 feet of the construction areas, vibration generated by other off-road construction equipment would not exceed the Caltrans or FTA standards. Ground vibration would also be generated by haul trucks operating on area haul routes. As shown in Table 3.9-11, vibration levels generated by trucks could reach as high as 0.076 in/sec PPV or 86 VdB at a distance of 25 feet. At a distance of 50 feet, these levels would attenuate to 0.027 in/sec PPV and 77 VdB. These levels are also less than Caltrans and FTA standards.

Vibration levels associated with pile driving could be as high as 1.518 in/sec PPV) or 112 VdB (referenced to 1 μin/sec and based on the RMS velocity amplitude) at a distance of 25 feet. Using FTA's recommended procedure for applying a propagation adjustment to these reference levels, predicted worst-case vibration levels would exceed Caltrans' recommended standard of 0.2 in/sec PPV with respect to the prevention of structural damage for normal buildings within 100 feet and FTA maximum acceptable vibration standard of 80 VdB with respect to human annoyance for residential uses within 300 feet. While the SBYC structure is not considered to be historically significant or particularly vulnerable to groundborne vibration, there are existing historical buildings in the project site proximity. The resulting pile-driving vibration levels would exceed both FTA's human disturbance-based standard and Caltrans' structural damage-based standard.

Alternatives 1, 2, 3, 4, and 5

Potential pier construction-related impacts to the noise environment within the community of Alviso would be minimized with implementation of the following mitigation measures; however, the potential for increased vibration levels within the community would still exist.

- **Mitigation Measure NOI-D: Reduce Groundborne Vibration.** Pile driving shall be conducted as far as practicable from residential and historical structures.
  - Vibration monitoring equipment shall be placed at the property lines adjacent to pile driving activities, with owner approval.
  - Vibration monitoring shall be conducted by a qualified acoustical consultant and conducted upon commencement of pile driving. The results of the vibration monitoring shall be compiled in report format and filed with the District. Pile driving is considered short term and would only require vibration monitoring during a single site visit.
  - A pre- and post-construction survey shall be conducted to assess potential architectural damage from pile driving at residential and historical property lines. The survey shall include visual inspection of the structure, documentation of the structure by means of photographs and video. This documentation shall be reviewed with the individual owner prior to any construction activity. Post-construction monitoring of the structure shall be performed to identify (and repair, if necessary) damage, if any, from construction vibrations. Any damage shall be documented with photographs and video. This documentation shall also be reviewed with the individual property owners.
  - Pile driving, or pre-drilling shall not occur during outside the daytime hours (i.e., 8 a.m. to 5 p.m. Monday through Friday)

As feasible, performing pile driving as far as possible from residential structures and pre-drilling holes before pile driving is conducted would reduce the probability of generating structural damage and/or human disturbance. However, these measures would not necessarily reduce ground vibration to levels below Caltrans' recommended standard of 0.2 in/sec PPV with respect to the prevention of structural damage for normal buildings or the FTA maximum acceptable vibration standard of 80 VdB with respect to human response for residential uses. This impact would remain **Significant and Unavoidable**.

Alternative 6: No Project

Alternative 6 would not result in any elevated pier installation noise levels at nearby noise-sensitive receptors; there would be **No Impact** and no mitigation would be necessary.

3.9.4 Relationship to South Bay Salt Ponds Phase 1 Action at Pond A8

The impacts identified above would be the same with or without the Phase 1 Action at Pond A8. If the Phase 1 Action at Pond A8 is successful, maintenance requirements for the Alviso Slough Restoration Project may be reduced, thereby reducing the duration of the impacts described above.

3.9.5 Sediment Disposal Options

Sediment disposal options include trucking, barging or conveying (e.g., slurry pipeline) the dredged sediment to a location where it could be re-used, rather than trucking the material to the Newby Island Landfill, as described in Chapter 2. These disposal options would result in similar impacts as considered above and would require the same or similar mitigation measures. If a barging option were selected, noise from haul trucks would be minimized but replaced by barging operations in the slough. The significant impact as a result of pile driving would not be avoided.

3.10 LAND USE AND PLANNING (LAND)

This section characterizes existing land uses within the Alviso Slough Restoration Project area. It includes a description of the physical setting, at regional and project levels, as well as regulatory background.

Applicable regional and local plans and policies were reviewed for information on existing land uses and relevant policies. The City of San Jose General Plan and Alviso Master Plan identify land use goals and existing land use designations in the Alviso Slough Restoration Project area. Potential impacts are identified.

3.10.1 Regulatory Setting

The Alviso Slough Restoration Project area is located in the City of San Jose, in Santa Clara County. The Santa Clara County and City of San Jose General Plans (including the Alviso Master Plan) were reviewed for this chapter. In addition, other plans of agencies with jurisdiction over the project were also reviewed. Table 3.10-1 summarizes the applicable plans and policies relevant to the proposed project.

Table 3.10-1 Applicable Plans and Policies

Agency + Plan or Policy	**Overview & Applicability**
FEDERAL	
None	
STATE	
California State Lands Commission *State Lands Lease*	The CSLC has jurisdiction over some of the land adjacent to Alviso Slough. This land - PRC 3968.9, Parcel 2 – includes submerged land and is currently leased to the District under an agreement with CSLC. If activities proposed by the District on leased land are not allowed by the current lease with CSLC, a new lease would need to be acquired.
LOCAL	
City of San Jose *San Jose 2020 General Plan Land Use/Transportation Diagram*	The San Jose 2020 General Plan Land Use/Transportation Diagram, as amended through May 2004, only refers to the Cargill Salt Ponds in describing the zoning for the area, which is outside the Urban Service Area, as Private Open Space (City of San Jose 2004). Private Open Space is a category that designates privately-owned lands used for low intensity, open space activity. Appropriate uses in this category include cemeteries, salt ponds, and land which is restricted to agricultural use and private buffer lands such as riparian set back areas (City of San Jose 2004).
City of San Jose *Alviso Master Plan*	The Alviso Project area is more specifically referred to in the Alviso Master Plan, which designates uses and policies pertinent to this section of incorporated San Jose. The community of Alviso was incorporated into San Jose in 1968. The Alviso Master Plan – adopted in 1998 and addressed in the San Jose 2020 General Plan by way of the Alviso Planned Community (APC) – establishes a long-term development plan for the sensitive Alviso planning area by guiding appropriate new development, community facilities, infrastructure, and beautification (City of San Jose 1998). The majority of land uses allowed by the APC adjacent to the Alviso

Table 3.10-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
	salt pond complex are Public Parks and Open Space, and Private Open Space. However, Mixed Use (Commercial, Housing, Civic), River Commercial and Combined Industrial Commercial uses are also planned for substantial sections of areas that abut the Alviso Slough Restoration Project area.
BCDC *Comprehensive Conservation and Management Plan – The San Francisco Estuary Project*	The Comprehensive Conservation and Management Plan (CCMP) was prepared by the BCDC. The BCDC manages the open waters, tidal marshes, managed wetlands, salt ponds, and narrow shoreline band (within 100-feet) of the San Francisco Bay segment of the Estuary (San Francisco Bay Conservation and Development Commission 1993). The Land Use Goals of the CCMP include the following: ▪ Establish and implement land use and transportation patterns and practices that protect, enhance, and restore the Estuary's open waters, adjacent wetlands, adjacent essential uplands habitat, and tributary waterways; ▪ Coordinate and improve planning, regulatory, and development programs of local, regional, state, and federal agencies to improve the health of the Estuary; and ▪ Adopt and utilize land use policies that provide incentives for more active participation by the private sector in cooperative efforts that protect and improve the Estuary. The Goals, policies, and recommendations of the CCMP that are relevant to the Proposed Project are as follows: **Action LU - 2.1:** Regional agencies should assist in identifying and developing consistent policies that provide an integrated framework for local governments to protect the resources of the Estuary. **Action LU -3.1:** Prepare and implement Watershed Management Plans that include the following complementary elements: 1) wetlands protection; 2) stream environment protection; and 3) reduction of pollutants in runoff. **Action LU - 3.2:** Develop and implement guidelines for site planning and BMPs.
San Francisco Bay Joint Venture *Implementation Strategy*	San Francisco Bay Joint Venture (SFBJV) is a collaborative effort by 27 public agencies and private non-profit and corporate organizations to protect, restore, increase and enhance wetlands, riparian habitat and associated uplands throughout the San Francisco Bay region to benefit birds, fish and other wildlife. Its Implementation Strategy (Strategy) details the organization's efforts to restore the San Francisco Estuary. No specific land use plans or objectives are discussed in the Implementation Strategy.

Table 3.10-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
Association of Bay Area Governments (ABAG) – Bay Trail Project	The Bay Trail Project is a non-profit organization administered by the Association of Bay Area Governments (ABAG) that coordinates the implementation of the Bay Trail. When complete, the Bay Trail will be a continuous 500-mile network that encircles the San Francisco and San Pablo bays in their entirety. It will link the shoreline of all nine Bay Area counties, 47 cities and connect to numerous public transportation systems. To date, over 300 miles of t he proposed system has been completed. One of the primary goals of the Bay Trail is to provide recreational, wildlife viewing and educational opportunities. Additional information concerning BCDC is found in Table 3.4-1.

3.10.2 Physical Setting

Regional

The greater South Bay, including the Alviso Slough Restoration Project area, consists of urban areas (residential, commercial, and industrial uses), bayshore mudflats, salt flats, salt marsh, salt evaporative ponds, creeks, flood control, and rural land and wildlife interpretative areas. South Bay municipalities in the vicinity of the Project area include the cities of Milpitas, San Jose, Sunnyvale, and Mountain View.

Project Area

The Alviso Slough Restoration Project area, located within the City of San Jose, is surrounded by urban land uses, bayshore mudflats, salt flats, salt marsh, salt evaporative ponds, creeks, flood control, rural land and wildlife interpretative areas. The Project area is generally bordered by the UPPR Bridge on the east, SR 237 (Mountain View-Alviso Freeway) to the south, and salt ponds to the north and west. The majority of the surrounding land uses to the east and south are commercial and industrial. The ponds (Ponds A8 and A12) north and west of the Project area are part of the SBSP Restoration Project Alviso pond complex, which is owned by USFWS.

The Alviso Marina County Park is a popular destination for pedestrians, birdwatchers and other outdoor enthusiasts who enjoy miles of shoreline trail around the marina with connections to the 9-mile Alviso loop trail and Sunnyvale Baylands sections of trail. The proposed project at Alviso Slough is located immediately adjacent to the existing Bay Trail.

The SBYC (clubhouse and boat docks) and the Blue Whale Sailing School are located in and adjacent to the slough in the Project area. The area adjacent to the slough is designated Mixed Use. The nearest residences are within the community of Alviso east of Pond A8 and Alviso Slough.

Up to 10 staging areas are proposed in the vicinity of the Project area (see Figures 2-7 and 2-8 in Chapter 2), within the City of San Jose. Generally, these sites are vacant and surrounded by other vacant lands. However, two sites in the vicinity of Gold Street would be adjacent to urban uses.

3.10.3 Environmental Impacts and Mitigation

Overview

Project impacts were analyzed within the applicable regulatory and significance criteria.

Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, a significant impact to land use and planning would occur if the Project would:

- Physically divide an established community;
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect;
- Conflict with any applicable habitat conservation plan or natural community conservation plan; or
- Convert important farmlands (Prime Farmland, Unique Farmland, Farmland of Statewide Importance) to nonagricultural use, conflict with existing zoning for agricultural use or a Williamson Act contract, or involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to nonagricultural use.

Impacts & Mitigation

The impacts analysis in this ~~Draft~~ Final EIR evaluates five action alternatives and the required No Project alternative. The action alternatives include vegetation removal and/or dredging, as described in Chapter 2. Under the No Project alternative, the District would not take any action in the Project area and existing programs would continue. The analysis covers impacts from the construction and maintenance phases, both in the slough and at staging areas.

All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by BCDC, CSLC, the District, or SBYC by the time of commencement of construction of this Project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Table 3.10-2 lists each impact identified for the proposed alternatives, along with the significance of each impact. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (less than significant and does not require mitigation), or Class IV (beneficial). Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections.

Because the Proposed Project would take place entirely within a reach of the Alviso Slough and would not result in the construction of any permanent structures, it would not physically divide the community of Alviso and its potential to do so is not discussed further. There are no habitat conservation plans or natural community conservation plans in place that cover the Alviso Slough Restoration Project area. Therefore conflicts with such plans would not occur.

Table 3.10-2 Impact and Mitigation Summary

Impact	Impact Significance	Mitigation Measures
Impact LAND-1: Conflict with plan, policy or regulations of agencies with jurisdiction over the Project.	Alts 1-5: Class III	--
	Alt. 6: No Impact	--
Impact LAND-2: Short-term construction related land use conflict.	Alts 1-5: Class II	LU-A
	Alt. 6: No Impact	--
Note: The impacts and mitigation would be the same both with and without the SBSP Restoration Project.		

No important farmlands (prime farmland, farmland of statewide importance, unique farmland, or farmland of local importance) as identified by the Department of Conservation Farmland Mapping and Monitoring Program occur within the Alviso Slough Restoration Project area. Therefore, no impacts to important farmlands would result from implementation of the Project or Alternatives. As such, this section focuses on a discussion of the project's potential to conflict with plan, policy, or regulation of agencies with jurisdiction over the project and short-term construction related land use conflicts.

***Impact LAND-1:* Conflict with plan, policy, or regulation of agencies with jurisdiction over the Project.**

Summary – Common to All Alternatives

All alternatives would result in a use that is compatible with current uses of the Project area. The alternatives would be consistent with the goals and policies of local and regional agencies which are intended to preserve and protect baylands from development and to restore tidal habitat. Development (e.g., residential, commercial, or industrial uses) that is incompatible with the existing uses of the project site would not occur. Therefore, implementation of the Alternatives would not result in any land use compatibility conflicts.

New recreation facilities are not part of any of the Alternatives. However, the restoration of the slough conditions would improve the tidal conditions and provide navigational enhancements, thus improving recreation access from the shores. This would improve opportunities for the public to enjoy the beauty and cultural history of San Francisco Bay (see Section 3.11). While this may result in a small increase in recreationalists to the area, this would not result in a land use change.

Vegetation removal and dredging activities would be conducted within the jurisdiction of the Bay Conservation and Development Commission (BCDC). In addition, the modifications to the Pond A8 weir would also be located within the BCDC salt pond jurisdiction. BCDC has indicated that two construction staging areas (identified as "1. SCVWD" and 2. Pellegrini" in Figure 2-7) are within the Commission's 100-foot shoreline band jurisdiction. Thus, a permit from the Commission would be required to construct the proposed project.

Alternatives 1, 2, 3, 4, and 5

Regional plans and applicable general plans as described in Table 3.10-1 contain goals and policies which promote restoration of the salt ponds in the South Bay. The proposed Alviso Slough Restoration Project would be consistent with these land use plans or designations. Therefore, implementation of the Project would not conflict with applicable land use plans or existing land use and zoning designations and considered **Less than Significant**.

Alternative 6: No Project

Under Alternative 6, no changes to the slough would occur. There would be **No Impact** and no mitigation would be necessary.

Impact LAND-2: **Short-term construction related land use conflict.**

Summary – Common to All Alternatives

Construction activities for the action alternatives include vegetation removal and/or dredging in the slough. Large equipment would be needed in the slough and at staging areas, which would preclude the use of that area during construction.

Construction impacts along the Bay Trail and within BCDC jurisdiction may include trail closures, detours, increased machinery and trucks hauling materials along the shoreline trails. Construction vehicles and trucks activities may affect connectivity of the trail north and south of the project and potentially obstruct views from the trail to the bay. Additionally, recreational users could also be limited by increased parking associated with construction workers during this time. Mitigation Measure LU-A requires that appropriate signage be posted to alert hikers and trail users of any changes affecting the trails in the project area. All trails would be restored to their original condition after project completion. Therefore, temporary impacts to trail users would be considered short-term and intermittent and less than significant.

Alternative 1, 2, 3, 4, and 5

The vegetation removal and/or dredging for Alternatives 1 through 5 would preclude recreational boat use in the immediate area for safety reasons. In addition, if staging occurs at the two sites near Gold Street (sites #3 and #4 – see Chapter 2), sensitive receptors may experience increased noise and odors. However, land use disruptions would be a short-term construction related impact. Once the vegetation removal and/or dredging activities are complete, the slough channel would be returned to its original use and would have enhanced navigation. Once the sediments are removed from the staging areas, these areas would be returned to previous conditions. This impact is considered **Less than Significant with Mitigation**.

- **Mitigation Measure LU-A. Notice to Residents and User Groups**. Prior to construction and maintenance activities, the District shall post notice of the upcoming activities, including construction location and duration. The notice shall be posted near the site, on the District web site and also sent to organizations and recreational use groups prior to construction and maintenance activities. It shall also be made available to the USFWS, Santa Clara County Parks and Recreation Department and City of San Jose for posting on their websites.

Alternative 6

Alternative 6 would not result in any construction. There would be **No Impact** and no mitigation would be necessary.

3.10.4 Relationship to South Bay Salt Ponds Phase 1 Action at Pond A8

The project would result in identical impacts to land use both with and without implementation of the Phase 1 Action at Pond A8. If the Phase 1 Action at Pond A8 is successful, maintenance requirements for the Alviso Slough Restoration Project may be reduced, thereby reducing the duration of the impacts described above.

3.10.5 Sediment Disposal Options

Sediment disposal options include trucking, barging, or conveying (e.g., slurry pipeline) the dredged sediment to a location where it could be re-used, rather than trucking the material to the Newby Island Landfill, as described in Chapter 2. These disposal options would result in similar impacts as considered above and would require the same mitigation measures.

This page intentionally left blank.

3.11 RECREATION (REC)

This section presents the regulations, conditions, and impacts analysis for recreation resources in and around the Project area. This discussion is informed, in part, by the work of an expert advisory panel consisting of three Bay Area public recreation specialists, who were employed by the District to identify key issues, opportunities, and project impacts/benefits related to recreation in and around Alviso Slough. These specialists – Chris Cruz of West Valley-Mission College District, Tammy Seale of PMC, and Mike Sherrod of RPM Design Group – conducted a site visit and reviewed the technical report that served as the basis of the analysis in this section.

3.11.1 Regulatory Setting

The lands in and around Alviso Slough are governed by local, regional, state, and federal plans and policies. The plans and policies of the City of San Jose and Santa Clara County General Plans, and region-wide recreation related plans influence the development of future recreation and public access facilities in and around Alviso Slough. Agencies such as the USFWS and BCDC also provide legal and managerial framework with which to plan and manage existing and proposed recreation and public access for the Project area (as these agencies either own, manage, or have jurisdiction over the Project area). Table 3.11-1, below, provides a summary of applicable plans and policies for the Alviso Slough Restoration Project.

Table 3.11-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
FEDERAL	
USFWS, USACE, and CDFG *SBSP Restoration Project*	The SBSP Restoration Project is a collaborative effort among federal, state and local agencies working with scientists and the public to develop a programmatic plan for habitat restoration, flood management and wildlife-oriented public access within the 15,100 acres of former Cargill salt ponds in South San Francisco Bay. Alviso Slough is bordered by Ponds A8 and A12 in the vicinity of the District's Alviso Slough Restoration Project (see Figure 1-2 in Chapter 1). The SBSP Restoration Project has not been approved; the Final EIS/R was released in December 2007.
USFWS and CDFG *SBSP Initial Stewardship Plan (ISP) and Don Edwards San Francisco Bay National Wildlife Refuge Amendment to Hunting Plan for Waterfowl*	The SBSP ISP was completed in 2003 and the ISP Final EIS/R was certified by USFWS and CDFG in 2004. The purpose of the ISP was to maintain salt ponds on an interim basis while the long-term restoration plan was developed. The ISP Draft EIS/R stated that the USFWS was to distribute a draft hunting plan and environmental document for public comment under a separate cover. The Recreation section in the SBSP Draft EIS/R reports that, under the Hunt Plan Amendment as part of the ISP, Refuge Ponds A2E, AB1, AB2, A3W, A3N, A5, A7 and the northern portion of A8 within the Alviso pond complex are open to waterfowl hunting on Saturdays, Sundays, and Wednesdays; a Refuge Special Use Permit is required. Pond A19 is open to waterfowl hunting under the current Hunt Plan.

Table 3.11-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
USFWS *Administration Act and Refuge Recreation Act (Recreation Act) of 1962 (16 U.S.C. 460k-460k-4) and* *National Wildlife Refuge System (NWRS) Improvement Act of 1997(PL 105-57)*	The Recreation Act governs the administration and public use of national wildlife refuges and authorizes the Secretary to administer areas within the NWRS for public recreation as an appropriate incidental or secondary use only to the extent that doing so is practicable and not inconsistent with the primary purpose(s) for which Congress and the Service established the areas. The Improvement Act established six wildlife-dependent recreational uses, when compatible, as the priority general public uses of the NWRS. These uses, sometimes referred to as the "Big Six" or "Priority Uses" are: hunting, fishing, wildlife observation, photography, environmental education, and interpretation.
STATE	
BCDC *San Francisco Bay Plan*	The San Francisco Bay Plan includes two main objectives: (1) protect the Bay as a great natural resource for the benefit of present and future generations, and (2) develop the Bay and its shoreline to their highest potential with a minimum of Bay filling.
BCDC *Water Trails Plan*	In September 2005, Governor Schwarzenegger signed California Assembly Bill 1296 which established the San Francisco Bay Area Water Trail. This legislation directs BCDC to lead a collaborative, public planning process to define policies, criteria and guidelines for appropriate trail location, design, operation and maintenance. The project staff will submit a final report containing recommendations on these elements to the state legislature in early 2008. The County Marina in Alviso is identified as a possible launch site in the initial project prospectus by Bay Access, Inc.
ABAG *Bay Trail Plan*	The Bay Trail Plan proposes the development of a 500-mile regional hiking and bicycling trail around the perimeter of San Francisco and San Pablo Bays. While over 253 miles of the trail already exist, the completed Bay Trail system will include a network of spine trails (recreational corridors linking all nine counties), spur trails (linking spine trails to general points of interest inland), and connector trails (restricted links to sensitive, educational, and employment areas inland). Planned trail projects around Alviso in the short term (one to five years) include developing trail alignments along several local roads linking Alviso Marina County Park to other Bay Trail segments and the Alviso area to trails near Coyote Creek. Mid term (6-10 years) and long term (10-15 years) planned projects include a trail on Pond A18, and several additional trails associated with area roads and linking to other trail systems.
LOCAL	
Santa Clara County *Parks and Recreation Strategic Plan*	The Strategic Plan focuses on purchasing and developing a network of regional parks and trails along the hillsides adjacent to the urban fringe, and along the creeks that pass through the urban service area.

Table 3.11-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
Santa Clara County *Trails Master Plan*	The Santa Clara County Trails Master Plan is an element of the Santa Clara County General Plan. The Plan proposes approximately 535 miles of off-street countywide trail routes throughout the county, as well as an additional 120 miles of on-street bicycle-only routes. San Francisco Bay Trail (#R-4) is identified as a priority trail. Lead agencies would be City of San Jose, and USFWS.
Santa Clara County *Alviso Marina Master Plan*	The Board of Supervisors approved a comprehensive Master Plan and EIR for park improvements at Alviso Marina County Park in October 1997, and the Department has been moving forward with the Master Plan implementation. Phase I improvements, completed in November 2005, included picnic facilities & landscaping, interpretive signage, decks and boardwalk, parking improvements, and trail improvements. Phase II is to be focused on construction of a new two-lane launch ramp and related facilities and habitat restoration at Alviso Slough on a 1.8 acre parcel that the County acquired from the federal government which is adjacent to the existing parking area. The existing non-functional ramp will be removed. Design work and permit applications to the various regulatory agencies has begun, and park expansion is expected to occur in 2009.
City of San Jose *Bay Trails Master Plan*	The purpose of this planning effort is to develop a safe, environmentally sensitive and interesting route through various land uses within the city (including sensitive riparian and bayland habitat), and to provide a framework for implementing the Bay Trail within the City of San Jose over the next 20 years. The section of the Bay Trail through San Jose is the largest remaining uncompleted trail segment in Santa Clara County and is a critical link between the Peninsula and the East Bay. The Master Plan proposes a 13.3-mile trail alignment divided into nine reaches. The 2002 Plan indicates Reaches 7 and 9 along the Alviso Slough. The City has completed surveys to support development of an interim trail alignment along Reach 7 (from County Marina Park to near the UPRR railway, along the existing gravel maintenance road that runs in front of the SBYC). The City plans to secure recreational easements from property owners in the near future. The City of San Jose has completed a Feasibility Study and Geotechnical Study for the construction of a 540' (Trail Reach 9B) pedestrian bridge and undercrossings beneath the bridge, the UPRR Railway and the Gold Street bridges.
Santa Clara Valley Water District *Clean, Safe Creeks and Natural Flood Protection Program*	The District's Clean, Safe Creeks and Natural Flood Protection Program aims to provide public access and recreational opportunities along riparian corridors. A long term goal of the program is the development of 70 miles of additional trails and associated open space along creeks and at other locations in the watersheds managed by the District. High priority trail projects selected for complete or partial grant funding are linked to Alviso area trails addressed by the Trails Master Plan, particularly along segments of Coyote Creek, Calabazas Creek, and San Tomas Aquino Creek. The City of San Jose is planning to implement trail improvements and a pedestrian

Table 3.11-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
	bridge over Alviso Slough near the UPRR bridge in Alviso (Bay Trail reach 7A) at some time in the near future.

3.11.2 Physical Setting

Recreation in and around Alviso Slough includes activities such as boating, walking, biking, fishing, wildlife viewing, and hunting. These activities are supported by several recreation facilities within and adjacent to the Project area. Figure 3.11-1 at the end of this section shows the location of Alviso Slough and nearby recreational facilities.

Regional

The following facilities offer recreation opportunities near Alviso but outside the Project area, and in the wider South San Francisco Bay area.

Don Edwards-San Francisco Bay National Wildlife Refuge

The salt ponds immediately adjacent to the Alviso Slough in the Project area, ponds A8 and A12, are within the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge). The Refuge is dedicated to preserving and enhancing wildlife habitat, protecting migratory birds, protecting threatened and endangered species, and providing opportunities for wildlife-oriented recreation and nature study. Ponds A8 and A12 are part of the Refuge's Alviso pond complex that covers approximately 8,700 acres. Portions of the Alviso pond complex were formerly owned by Cargill prior to purchase by USFWS in 2003. The Environmental Education Center (EEC), operated by the Refuge, is near the southeast corner of Pond A16 and is easily reached by road or trail from Alviso. The EEC provides historical and wildlife habitat displays, an observation tower, a boardwalk over the adjacent New Chicago Marsh, a native plant garden, picnic tables, and a covered picnic shelter. The EEC's main building contains two classrooms, an auditorium, and an enclosed observation tower. A boardwalk winds through seasonal wetland habitat to provide wildlife viewing opportunities.

The San Francisco Bay Bird Observatory (SFBBO) has offices in trailers parked on Refuge Property in Alviso, adjacent to the Alviso levee. The SFBBO does not provide visitor services at their office in Alviso but is dedicated to the conservation of birds and their habitats through science and public outreach, and to contributing to informed resource management decisions in the San Francisco Bay Area. Research provides long term data on avian population trends, which is instrumental in decisions affecting the preservation and restoration of important wetland and tidal marsh habitat. In addition, the SFBBO education program provides birding workshops and demonstrations and expert guided walks in the vicinity of Alviso and elsewhere on the Bay.

Sunnyvale Baylands Park

Sunnyvale Baylands Park is situated about one mile west of Alviso, south of Pond A8. The park, operated by the City of Sunnyvale, contains 70 acre of parkland and 105 acres of protected seasonal wetlands. The park provides picnic areas, a children's play area, an amphitheater, and trail staging areas providing access to the Bay Trail. Along with picnicking and use of the play area, the park offers opportunities for hiking, bicycling, and wildlife observation.

Stevens Creek Shoreline Nature Study Area

The Stevens Creek Shoreline Nature Study Area is about 8.5 miles west of Alviso, and is a 53 acre parcel owned by the Midpeninsula Regional Open Space District. Facilities are limited to a staging area and a half-mile trail. The area is particularly popular with birdwatchers.

Mountain View Shoreline Park

Directly across Stevens Creek from the Stevens Creek Shoreline Nature Study Area is the Mountain View Shoreline Park, a well developed facility on about 660 acres. The park has a 50-acre lake with a boathouse, an 18-hole golf course, a clubhouse, a historic house, a kite flying area, and several miles of paved and unpaved trails. The trails include a segment of the Bay Trail and feature interpretive stations. In addition to golf, picnicking, and kite flying, the park trails provide wildlife viewing opportunities on adjacent sloughs and salt ponds.

Palo Alto Baylands Preserve

The 1,940 acre Palo Alto Baylands Preserve is a short distance west of Mountain View Shoreline Park, and provides a diverse range of both developed recreation facilities and undeveloped lands. The park contains the largest tract of undisturbed marshland remaining in the San Francisco Bay. Fifteen miles of multi-use trails provide access to a mixture of tidal and freshwater habitats. There are wildlife observation platforms, benches and picnic facilities with barbecues. Many consider this area to be one of the best bird watching areas on the West Coast. The park also includes an Interpretive Center, an Art Park, and an Athletic Center for baseball and softball.

The Bay Trail

The Bay Trail is a planned recreational corridor that, when complete, will encircle San Francisco and San Pablo Bays with a continuous ~~400~~ 500-mile network of bicycling and hiking trails. It will connect the shoreline of all nine Bay Area counties. To date, approximately ~~240~~ 300 miles of the alignment—over half the Bay Trail's ultimate length—have been completed.

From the west, the Bay Trail comes into Alviso from Sunnyvale Baylands Park, paralleling the north side of SR 237 along Great American Parkway, and following Gold Street into Alviso. The Alviso Slough Loop Trail is part of the Bay Trail and, as described above, loops around ponds A9-A14 of the Portions of the nine-mile loop are not suitable for travel during the rainy season. In the future, the Bay Trail will run on the Alviso levee, beginning at the UPRR bridge over Alviso Slough, immediately downstream of the Gold Street bridge, passing the SBYC and connecting to the Alviso Marina County Park, where the levee terminates.

Bay Trail users, particularly cyclists, also use street sections within Alviso. The on-street segment between the Gold Street Bridge and the connection to the main trail along Great American Parkway is considered "Unimproved Bay Trail". Heading east from Alviso, additional unimproved on-street segments of the Bay Trail follow State Street to Los Esteros and Zanker roads, where a future segment is planned to lead east to Coyote Creek and thence across the creek and north to existing and planned segments on the east side of the Bay. One branch of the unimproved on-street trail leads up Grand Boulevard to its terminus at the EEC.

A future bridge proposed by the City of San Jose, to be located within the Project area immediately downstream of the UPRR bridge, would provide an off-street crossing of Alviso Slough connecting with private land known as the Legacy property. If a public trail easement is attained on the Legacy property, the Bay Trail will be re-aligned away from roadways and connect users to the adjacent SBSP Restoration Project ponds and associated restoration areas, as well as to the Sunnyvale Baylands Park further to the West.

Other Alviso Area Trails

Other nearby trails include the Guadalupe River Trail and the Mallard Slough Loop Trail, both of which connect to the trails described above, in and near Alviso. The City of San Jose's Guadalupe River Trail uses the existing gravel maintenance road and terminates at Gold Street. The Guadalupe River Trail, recently improved with signage and street connections on an interim basis, follows the river levees north from the Gold Street bridge in Alviso toward central San Jose and, when its development is completed, will connect to downtown San Jose and to Coyote Creek trails. Although it is just outside of the project area, the City of San Jose has noted that this trail system is a nearby source of recreation users. The Mallard Slough Loop Trail is the second of two major trail loops in the Alviso Area, encircling ponds A16 and A17 within the Refuge, immediately to the east of the Alviso Slough Loop Trail. A crossing over the UPRR tracks, used by Refuge and other authorized vehicles as well as trail users, connects the Mallard Slough and the Alviso Slough Loop Trails. The Mallard Slough Trail can be used to reach the EEC, located adjacent to Mallard Slough and Pond A16.

Fishing and Hunting Access in the Project Area

Many fish species present in the Bay are also present in Alviso Slough. Visitors are allowed to fish from boats in the Bay and sloughs, but not on any ponds within the Alviso pond complex. Due to poor access, little fishing presently appears to occur in the slough in the vicinity of Alviso.

Hunting on the ponds adjacent to Alviso Slough is regulated by the USFWS. Under the 2004 Hunt Plan Amendment for Refuge, Ponds A2E, AB1, AB2, A3W, A3N, A5, A7 and the northern portion of Pond A8 within the Alviso pond complex (see Figure 1-2 in Chapter 1) are open to hunting on Saturdays, Sundays, and Wednesdays for three months of the year (waterfowl hunting season is approximately mid-October to mid-January). A Refuge Special Use Permit is required. Some hunters walk in to the northern portion of Pond A8 from Gold Street in Alviso. Hunters can hunt from the levees and may use small private boats (electric or non-motorized only) to access the blinds. Boat access for hunters is through Coyote Slough or from the South Bay. Substantial vegetation in Alviso Slough prohibits direct access from Alviso Slough into the ponds. Hunting is not permitted on Ponds A9 – A15, on the opposite side of Alviso Slough from Ponds A5 – A8.

Project Area

The Alviso Slough Project area is within about a 30 minute drive to most of the more than 1.7 million residents of Santa Clara County, which includes the City of San Jose and surrounding communities, and is easily accessed from anywhere in the South San Francisco Bay region. Vehicular access to Alviso is from SR 237 and from arterial roads connecting to other parts of San Jose (via Great American Parkway, Lafayette St, North 1st St.). For most users, Alviso Slough is accessed on foot via the levee trail heading south from the Alviso Marina County Park, or by walking up the steps of the levee from Hope Street near the SBYC. It can also be accessed on foot or by bicycle from the south end near Gold Street and the UPRR crossing.

The following recreation facilities are within the Project area.

Alviso Marina County Park

The Alviso Marina County Park, which was renovated in 2005, provides a paved parking lot with space for about 60 vehicles, picnic sites, a restroom and drinking water, a boardwalk trail and wildlife observation deck, and interpretive signage. The County Park offers nearly unobstructed views of the lands and wildlife, particularly waterfowl, found in the immediate salt ponds as well as outward vistas to the San Francisco Bay and surrounding hills. Walkers, bicyclists, birders, and others use the Alviso Marina County Park as a parking and meeting point. According to the Santa Clara Parks and Recreation Strategic Plan, the park receives an average of more than 30,000 visits annually. The park offers recreationists easy access to the Alviso Slough Loop Trail (part of the Bay Trail), which loops around ponds A9-A14 of the Refuge. The park has a caretaker who resides on-site in an RV. The boat ramp at the park, the only ramp in the Alviso area, is currently unusable due to sedimentation and subsequent encroachment by vegetation.

South Bay Yacht Club

Situated along the bank of Alviso Slough within the Project area, the SBYC was originally formed in 1888 as the South Bay Yachting Association. In 1896 the club was re-formed as the South Bay Yacht Club and a clubhouse was built in Alviso in 1903. The clubhouse, with a pub style bar, dining area, and restrooms, was moved in 1983 to its current position on the levee because of continued flooding. The Yacht Club docks extend upstream from the clubhouse about 850 feet and are accessed via two gated and locked gangways from the levee. Although the berths have been largely filled in with sediment and vegetation growth, there are a currently a few dozen boats moored at the Yacht Club docks. Boat types include several large sailboats and powerboats over 30 feet in length as well as smaller craft. In recent years, some dilapidated boats moored in the area have been removed at the request of the BCDC. A few large commercial fishing boats used on the Bay are also kept at the SBYC docks.

Blue Whale Sailing School

The Blue Whale Sailing School, located along the levee of Alviso Slough adjacent to and downstream of the SBYC, was founded in 2000 as a charitable educational corporation. The facility consists of a portable trailer that serves as an office, a gravel parking area with space for about six vehicles, and a floating dock attached to a cement landing. The facility occupies about 300 feet of levee frontage on the slough, and covers an area of less than one-half acre. The school moors several small and medium sized sailboats along the slough and at the school's floating dock, and other boats are beached near the office. The landing and dock at the Blue Whale Sailing School is posted by BCDC as public shoreline. The school has a gated and locked private drive onto the levee located across the levee from the facility which provides vehicle access from Hope Street in Alviso.

Alviso Levee Trail

A gravel trail runs on the top of the Alviso levee through the Project area. This trail has also been referred to as the Reach 7 Trail noted under the Bay Trail. This segment of trail has not been officially opened by the City of San Jose, although some recreation improvements have recently been installed by the District, such as cement benches with educational signage incorporated into them. The slough in this area is posted by BCDC as public shoreline. The City and the District intend to provide the trail access on the levee under an official Joint Trail Agreement, with additional improvements including signage and fencing to discourage trail users from crossing the railroad tracks. (Occasional trail users cross the tracks now, and have also been observed using the railroad bridge itself as a shortcut to roads and trails on the opposite side). The proposed Bay Trail will include 3 undercrossings; one at the proposed pedestrian bridge, one at the UPRR bridge, and one at the Gold Street Bridge.

Alviso Historic District and Other Historic Resources

Bike riders and walkers, as well as people touring by car, may take advantage of sightseeing opportunities in and around Alviso, particularly in Alviso's Historic District. The 130-year old town is listed in the National Register of Historic Places. The Historic District includes the old Bayside Cannery, adjacent to the Alviso Levee and the Alviso Marina County Park and now owned by USFWS. The building is unoccupied and in poor condition; the SFBBO operates its headquarters out of a trailer on the property. Nearby are the 1887 Tilden-Laine house, the best example of Victorian architecture remaining in town, and the adjacent Laines Grocery building, a wooden building dating to the earliest days of the community. Additional historic structures marked with commemorative plaques are on the opposite side of the downtown area, along El Dorado Street. The SBYC clubhouse, as described above, is over 100 years old and is considered a local landmark.

Drawbridge, a ghost town dating back to the late 1800s, is in the marsh along the railroad tracks about two miles north of Alviso. The site is no longer open to the public, but remains of high interest to some area visitors.

3.11.3 Environmental Impacts and Mitigation

Overview

This section describes environmental impacts and mitigation measures related to recreation, including the criteria used to determine the significance of impacts.

Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, a significant impact to recreation resources would occur if the Project would:

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
- Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

In addition, it was determined that the Project would result in a significant effect on recreational resources if it would:

- Substantially reduce or alter recreational opportunities or substantially degrade or alter recreational experiences.

The Project would not increase use of recreational facilities nor include recreational facilities or require the construction or expansion of recreational facilities. Therefore, the first and second significance thresholds listed above are not relevant to this analysis.

Impacts and Mitigation

The impacts analysis in this ~~Draft~~ Final EIR evaluates five action alternatives and the required No Project alternative. The action alternatives include vegetation removal and/or dredging, as described in Chapter 2. Under the No Project alternative, the District would not take any action in the Project area and existing programs would continue. The analysis covers impacts from the construction and maintenance phases– both in the slough and at staging areas.

All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by BCDC, CSLC, the District, or SBYC by the time of commencement of construction of this Project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Table 3.11-2 lists each impact identified for the proposed alternatives, along with the significance of each impact. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (less than significant and does not require mitigation), or Class IV (beneficial). Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections.

Table 3.11-2 Impact and Mitigation Summary

Impact	Impact Significance	Mitigation Measures
Impact REC-1: Loss of recreational opportunities or access, or degradation in recreational experiences due to construction.	Alts 1-5: Class II	REC-A
	Alt. 6: No Impact	--
Impact REC-2: Changes to long-term recreational opportunities and experiences.	Alts 1-5: Class IV	--
	Alt. 6: No Impact	--

Note: The impacts and mitigation would be the same both with and without the SBSP Restoration Project.

Impact REC-1: **Loss of recreational opportunities or access, or degradation in recreational experiences due to construction.**

Summary – Common to All Alternatives

The Project would involve construction activities in and around Alviso Slough. Portions of the Bay Trail (existing and proposed) would be traversed by the proposed haul route. Specifically, Taylor Street is considered a Spine Trail of the San Francisco Bay Trail (see Figure 3.11-1). Gold Street, Grand Avenue, and Los Esteros Road are proposed for inclusion in the San Francisco Bay Trail. Construction-related activity would not preclude use of the trail. Although located just outside of the project area, the Lower

Guadalupe trail users, including pedestrians and bicyclists, could also be affected by temporary construction closures or disruptions.

As a safety precaution, small portions of the slough and the levee top would be inaccessible during construction. This could include public access for recreation users along the existing Reach 7 and future Reach 9 trails (should Reach 9 be built before the proposed project is implemented) as defined in the Bay Trails Master Plan. For all trails operated by the City of San Jose, temporary closures must follow the Council adopted policy on trail closure noticing and would need to be coordinated with the City of San Jose Trail Program Manager prior to closure. Construction equipment would be left in the construction area overnight and on weekends. Activities would not preclude parking and/or visitor use of the Alviso Marina County Park.

Alternatives 1, 2, 3, 4, and 5

The activities for Alternatives 1, 2, 3, 4, and 5 would preclude use of the levee top and the slough around the SBYC during construction. While the immediate construction area would be off limits to visitors, the surrounding trails and the Alviso Marina County Park would be accessible. This impact is temporary, and is considered **Less than Significant with Mitigation** after implementation of the following measure.

- **Mitigation Measure REC-A: Alternate recreational trail route signage.** During construction, or whenever an existing recreational trail is closed off due to project construction related activities, the District shall post signage indicating an alternative route around the construction area. For all trails within City of San Jose jurisdiction, closures must be coordinated with the City's Trail Program Manager. If construction occurs during the hunting season, additional signs shall be posted near the construction site marking appropriate access and parking locations for hunters.

Alternative 6: No Project

Under the No Project alternative, the District would take no action to widen or deepen Alviso Slough between Gold Street and the Alviso Marina County Park. The No Project alternative would result in **No Impact** on recreation.

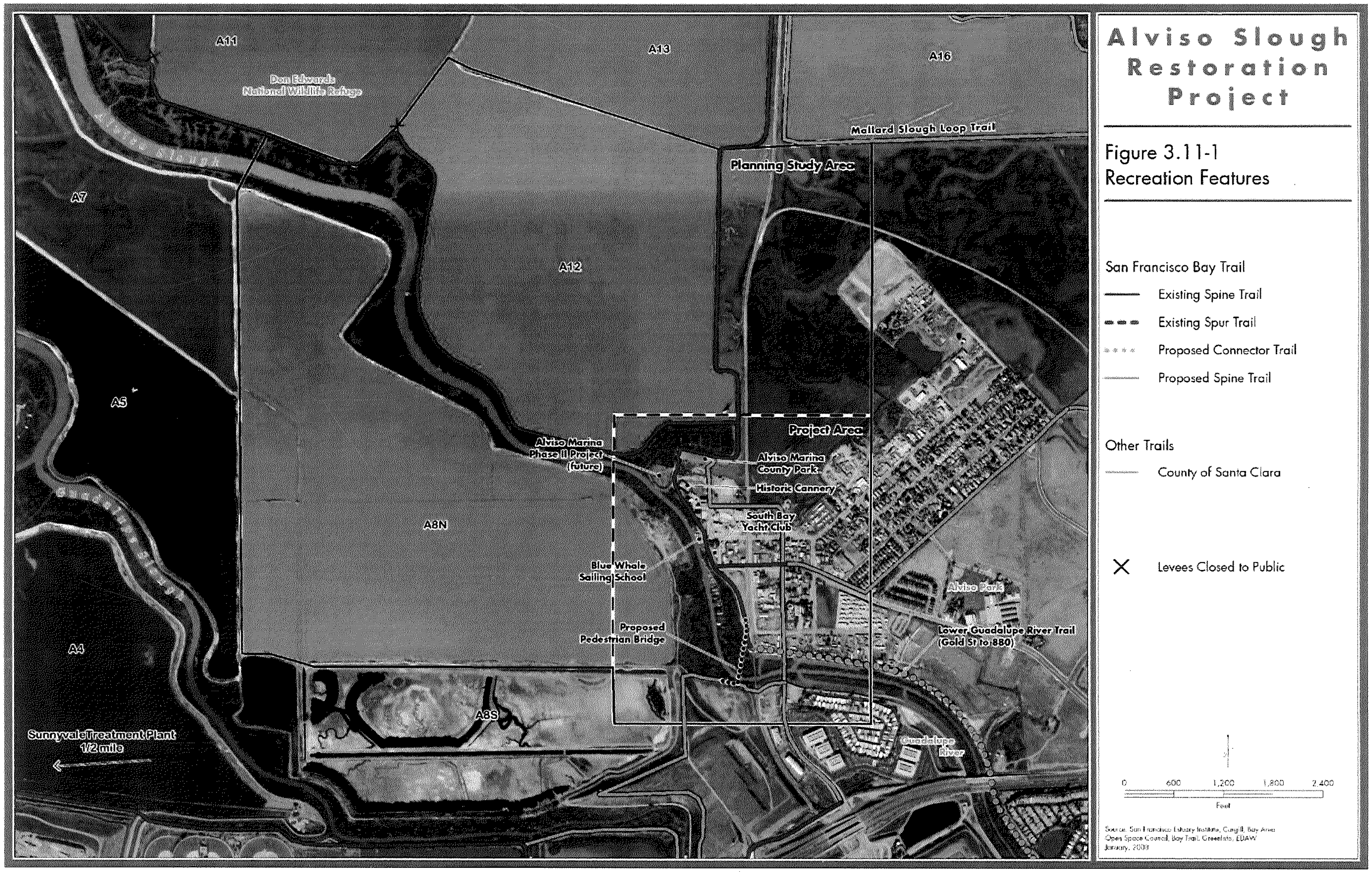
Impact REC-2: Changes to long-term recreational opportunities and experiences.

Summary – Common to All Alternatives

Implementation of the Alviso Slough Restoration project would result in improvements to recreational and navigational opportunities in the slough by creating more width and/or depth in the slough to accommodate more or larger boats in the Project area.

Alternative 1, 2, 3, 4, and 5

The added width and/or depth would be limited to the area around the SBYC; the slough would continue to be limited in width and depth from the old County Marina out to the Bay. The improvements to the slough in the Project area, coupled with installation of new docks at the SBYC, could result in an increase in boating in Alviso – both for existing boat owners in Alviso and boats visiting SBYC, as well as smaller day-use vessels like kayaks. Alternatives 1, 2, 3, 4, and 5 would result in a **Beneficial Impact** to long-term recreational opportunities and experiences, especially in conjunction with the SBSP Restoration Project and the County's park expansion (see Chapter 1).



Alviso Slough Restoration Project

Figure 3.11-1
Recreation Features

Source: San Francisco Estuary Institute, Cargill, Bay Area Open Space Council, Bay Trail, Greeninfo, EDAW
January, 2008

Alternative 6: No Project

Under the No Project alternative, the District would take no action to widen or deepen Alviso Slough between Gold Street and the Alviso Marina County Park. The No Project alternative would result in **No Impact** on recreation due to construction.

3.11.4 Relationship to South Bay Salt Ponds Phase 1 Action at Pond A8

If the Phase 1 Action is successful, maintenance requirements as part of the Alviso Slough Restoration Project could be reduced somewhat, thereby possibly and slightly reducing the duration of impacts to recreation due to construction. The impacts and mitigation identified above would be the same under this scenario.

3.11.5 Sediment Disposal Options

Sediment disposal options include trucking, barging, or conveying (e.g., slurry pipeline) the dredged sediment to a location where it could be re-used, rather than trucking the material to the Newby Island Landfill, as described in Chapter 2. These disposal options would result in similar impacts to recreation as considered above and would require the same mitigation measures.

3.12 CULTURAL AND HISTORIC RESOURCES (CUL)

This section describes background research completed for the Alviso Slough Restoration Project as well as the cultural resources identified within the Alviso Slough Project site. The information presented here was gathered from previously prepared cultural resource inventories for the region. The proposed development site is located within Township 5 South, Range 1 West, in unsectioned portions of the Rincon de los Esteros land grant as depicted on the Milpitas 7.5-minute U.S. Geological Survey (USGS) quadrangle map.

3.12.1 Regulatory Setting

Table 3.12-1, below, provides a summary of applicable plans and policies governing cultural resources issues for the Alviso Slough Restoration Project.

Table 3.12-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
FEDERAL	
USACE *Section 106 of the NHPA (*36 CFR Part 800)	Requirement for federal agencies to take into consideration the potential effects of proposed undertakings on cultural resources listed on or determined potentially eligible for inclusion in the National Register of Historic Places (NRHP), and to allow the Advisory Council on Historic Preservation the opportunity to comment on the proposed undertaking.
Code of Federal Regulations *36 CFR 800.4(a)(1)*	Need for an Area of Potential Effects map.
Code of Federal Regulations *36 CFR 60.4*	Criteria for determining site significance.
STATE	
CEQA Guidelines *Section 15064.5*	Determining the significance of impacts to archaeological and historical resources.
California Health and Safety Code *Section 7050*	Requirement to contact county coroner if human remains are identified; requirement to contact county coroner if Native American remains are identified.
California Public Resources Code *Section 5097.9*	Native American consultation procedures when remains are identified.
CEQA Statutes *Section 21084.1*	Definition of an Historical Resource and substantial adverse change.
CEQA Statutes *Section 21083.2*	CEQA Statutes regarding determination of effects on unique archaeological resources.
LOCAL	
Santa Clara County *Santa Clara County General Plan Policy C-RC 49*	Cultural heritage resources within Santa Clara County should be preserved, restored wherever possible, and commemorated as appropriate for their scientific, cultural, historic and place values

Table 3.12-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
Santa Clara County *Santa Clara County General Plan Policy C-RC 50*	Countywide, the general approach to heritage resource protection should include the following strategies: 1. Inventory and evaluate heritage resources 2. Prevent or minimize adverse impacts on heritage resources. 3. Restore, enhance, and commemorate resources as appropriate.
Santa Clara County *Santa Clara County General Plan Policy C-RC (i) 26*	Explore designation of historic districts to preserve character of areas rich in heritage resources
Santa Clara County *Santa Clara County General Plan Policy* C-RC 52	Prevention of unnecessary losses to heritage resources should be ensured as much as possible through adequate ordinances, regulations, and standards review procedures. Mitigation efforts, such as relocation of the resource, should be employed where feasible when projects will have significant adverse impact upon heritage resources
Santa Clara County *Santa Clara County General Plan Policy* C-RC 54	Heritage resources should be restored, enhanced, and commemorated as appropriate to the value and significance of the resource
Santa Clara County *Santa Clara County General Plan Policy* C-RC 55	Public awareness and appreciation of existing heritage resources and their significance should be enhanced through community organizations, neighborhood associations, the educational system, and governmental programs
City of San Jose *City of San Jose 2020 General Plan Goal for Historic, Archaeological and Cultural Resources*	Preservation of historically and archaeologically significant structures, sites, districts and artifacts in order to promote a greater sense of historic awareness and community identity and to enhance the quality of urban living.
City of San Jose *City of San Jose 2020 General Plan Historic, Archaeological and Cultural Resources Policy 1*	Because historically or archaeologically significant sites, structures and districts are irreplaceable resources, their preservation should be a key consideration in the development review process.
City of San Jose *City of San Jose 2020 General Plan Historic, Archaeological and Cultural Resources Policy 8*	For proposed development sites which have been identified as archaeologically sensitive, the City should require investigation during the planning process in order to determine whether valuable archaeological remains may be affected by the project and should also require that appropriate mitigation measures be incorporated into the project design.
City of San Jose *City of San Jose 2020 General Plan Historic, Archaeological and Cultural Resources Policy 9*	Recognizing that Native American burials may be encountered at unexpected locations, the City should impose a requirement on all development permits and tentative subdivision maps that upon discovery of such burials during construction, development activity will cease until professional archaeological examination and reburial in an appropriate manner is accomplished.

3.12.2 Physical Setting

Regional

Physical Setting

The Project region is located in Santa Clara County, California and is comprised of salt ponds and marshes on either side of Alviso Slough, as well as the western portion of the bayshore community of Alviso. The predominant historic use of the landscape for salt production has left clear evidence behind in the form of piers, pilings, levees, berms, irrigation ditches, and Archimedes Screws. Remnants of historic dwelling areas, such as the pilings at Drawbridge and the settlement at Alviso, are also present in the Project area. More recent structures include boardwalks and high tension lines and towers used by PG&E.

Over time, changing climatic patterns affected the variety and availability of natural resources throughout California. These changes led to shifts in subsistence and settlement patterns among the Native American inhabitants and contributed, at least in part, to regional cultural differentiation seen in the archaeological record. By mid prehistoric times, Native groups associated with the Ohlone and Miwok peoples resided in and near the Project area (Moratto 1984). There were an estimated 7,000-10,000 Native Americans living near the Bay by the time of the first major European contact in 1770 (Kroeber 1925, Levy 1978). Archaeological remains related to the prehistoric occupation of the area are evidenced by hundreds of shellmounds and occupation sites that lined the shores of the San Francisco, San Pablo and Suisun Bays (Nelson 1909, Gifford 1916). The locations of these shellmounds approximately follow the current shoreline, but also line major tributaries feeding into the Bay.

Many of the shellmounds known in the Bay region have been found in close relationship with marshy areas. A number of shellmounds stand partially below current sea level, indicating that their accumulation began during lower water level occurrences in the past (Nelson 1909, Bickel 1978). Given the long duration both of the Bay water rise and human occupation of the shore zone, it is likely that other sites are below current sea levels.

The configuration of the Bay shoreline has also changed in the last hundred years or so due to the deposition of gold mining sediments, agriculture, the narrowing of river channels through levee construction, construction of salt ponds, development of "made land," and more modern construction and fill near the shore. As an example of recent changes, it is estimated (Moratto 1984) that 875 cubic meters of sediment were deposited in San Francisco Bay from 1850-1914 as a result of mining in the Sierra Nevada foothills.

Prehistorically, the dominant natural vegetative communities in the region were a mosaic including saltmarsh, redwood forest, grassland, and mixed-evergreen woodland. Each sustained an array of animals including deer, elk, various waterfowl, sea mammals, shellfish, and a wide variety of fish species.

Prehistoric Setting

The Central California Taxonomic System (CCTS) was developed as a framework for comparing different archaeological sites in central California (Heizer and Fenenga 1939). The earliest versions of the CCTS emphasized the concept of cultural Horizons. However, the Horizon concept was considered too broad and later was refined with the addition of cultural Patterns (Bennyhoff 1968) and further subdivided later yet into Phases or Aspects. A number of refinements added more subdivisions and broke the system up by geographical as well as temporal variation (Bennyhoff 1977).

In the early 1970s, Fredrickson (1973, 1974) proposed a sequence of cultural manifestations or Patterns for the central districts of the North Coast Ranges, placing them in a framework of cultural periods he believed were applicable to California as a whole. Fredrickson took a broad view of archaeological material culture and defined the term pattern as "...an adaptive mode shared in general outline by a number of analytically separable cultures over an appreciable period of time within an appreciable geographic space" (Fredrickson 1973). These different cultural modes could be characterized by:

- similar technological skills and devices (specific cultural items);
- similar economic modes (production, distribution, consumption), including especially participation in trade networks and practices surrounding wealth (often inferential), and
- similar mortuary and ceremonial practices.

Fredrickson also recognized that the economic/cultural component of each pattern could be manifested in neighboring geographic regions according to the presence of stylistically different artifact assemblages. He introduced the term aspect as a cultural subset of the pattern, defining it as a set of historically related technological and stylistic cultural assemblages. Fredrickson argued that these temporal periods should be kept separate from the dating and definition of particular patterns given the coexistence of more than one cultural pattern operating at any given point in time in California prehistory (Fredrickson 1974). This integrative framework provides the means for discussing temporally equivalent cultural patterns across a broad geographic space.

The earliest well-documented entry and spread of humans into California occurred at the beginning of the Paleo-Indian Period (10,000–6000 B.C.). Social units are thought to have been small and highly mobile. Known sites have been identified in the contexts of ancient pluvial lake shores and coast lines evidenced by such characteristic hunting implements as fluted projectile points and chipped stone crescent forms. Prehistoric adaptations over the ensuing centuries have been identified in the archaeological record by numerous researchers working in the area since the early 1900s, as summarized by Fredrickson (1974) and Moratto (1984).

Few archaeological sites have been found in the Bay Area that date to the Paleo-Indian or the Lower Archaic (6000–3000 B.C.) time periods; however, archaeologists have recovered a great deal of data from sites occupied by the Middle Archaic period. The lack of sites from earlier periods may be because of high sedimentation rates, leaving the earliest sites deeply buried and inaccessible. During the Middle Archaic Period (3000–500 B.C.), the broad regional patterns of foraging subsistence strategies gave way to more intensive procurement practices. Subsistence economies were more diversified, possibly including the introduction of acorn processing technology. Populations were growing and occupying more diverse settings. Permanent villages that were occupied throughout the year were established, primarily along major waterways. The onset of status distinctions and other indicators of growing sociopolitical complexity mark the Upper Archaic Period (500 B.C.–A.D. 700). Exchange systems become more complex and formalized and evidence of regular, sustained trade between groups was seen for the first time.

Several technological and social changes characterized the Emergent Period (A.D. 700–1800). The bow and arrow were introduced, ultimately replacing the dart and atlatl. Territorial boundaries between groups became well established. It became increasingly common that distinctions in an individual's social status could be linked to acquired wealth. Exchange of goods between groups became more regularized with more goods, including raw materials, entering into the exchange networks. In the latter portion of this period (A.D.1500–1800), exchange relations became highly regularized and sophisticated. The clamshell disk bead became a monetary unit for exchange, and increasing quantities of goods moved greater distances and specialists arose to govern various aspects of production and exchange.

The Middle and Upper Archaic and Emergent Periods are further broken down under the CCTS. These three time periods are well represented in archaeological assemblages in the general vicinity of the Project area. The assemblages are discussed in detail in Bennyhoff and Fredrickson (1969) and Moratto (1984) and summarized here.

The Windmiller Pattern (3000–500 B.C.) peoples placed an increased emphasis on acorn use as well as a continuation of hunting and fishing activities. Ground and polished charmstones, twined basketry, baked-clay artifacts and worked shell and bone were hallmarks of Windmiller culture. Widely ranging trade patterns brought goods in from the Coast Ranges and trans-Sierran sources as well as closer trading partners. Distinctive burial practices (ventrally extended, oriented westward) identified with the Windmiller Pattern also appeared in the Sierra foothills, indicating possible seasonal migration into the Sierra. Perforated charmstones were associated with some burials, and manos and metates and small mortars were used, but rare.

The Berkeley Pattern (200 B.C.–A.D. 700) exhibited an increase in the use of acorns as a food source than was seen previously in the archaeological record. Distinctive stone and shell artifacts differentiated it from earlier or later cultural expressions. Burials were predominantly placed in a tightly flexed position, and frequently included red ochre. Minimally shaped mortars and pestles were much more prevalent than manos and metates and non-stemmed projectile points became more common. Dating of the Berkeley Pattern varies across central California; in the Stockton region, the Windmiller Pattern continued longer than in other areas, gradually giving way to the changes that marked the Berkeley Pattern (Bennyhoff 1982). These people combined Windmiller and Berkeley pattern traits, as seen in mortuary practices and the stone tool industry.

The Augustine Pattern (A.D. 700–1800) reflected increasing populations resulting from more intensive food procurement strategies, as well as a marked change in burial practices and increased trade activities. Intensive fishing, hunting and gathering, complex exchange systems and a wider variety in mortuary patterns were all hallmarks of this period. Mortars and pestles were more carefully shaped; bow and arrow technology was present. Fishing implements became more common, trade increased and cremation was used for some higher status individuals.

Bay Area archaeological investigations have occurred in three major waves (Lightfoot 1997). The first, early in the 20th century, focused on examination of the most visible prehistoric site type; shellmounds, sometimes hundreds of feet in diameter, that lined the bayshore, as well as large earthen mounds found near stream outlets and banks running inland. Early archaeologists assumed that the shellmounds were the remains of large Native American villages that subsisted solely on bay and estuary resources. The second wave of investigations took place after World War II, when mounds and other sites were investigated by archaeologists working through the various local universities, particularly U.C. Berkeley, San Jose State, and Stanford. By this period, research questions being asked had broadened to a wider interpretation of the region's prehistory and the connection to different geographic areas. In the last 30 years or so, the third push in archaeological exploration has been largely the result of compliance with new cultural resources regulations. The most recent research has been able to take advantage of new technology and paradigms that have evolved over the course of the 20th century.

Thoughts regarding the development and use of these shellmounds have changed as investigations have expanded. Nelson (1909) regarded the Bay Area as an archaeological unit and recorded 425 shell mounds along San Francisco Bay, San Pablo Bay and the Carquinez Strait, and along the East Bay shoreline, as well as numerous earthen mounds up and down the various drainages. He noted that, even by then, there were no undisturbed mound sites left as they were being destroyed by agriculture and urban development, or were being mined for fertilizer. Gifford (1916) analyzed materials from several of the mound sites and concluded that they were created by refuse from village sites that had accumulated over hundreds or thousands of years.

As the century progressed, questions arose regarding the duration of occupation of the mounds and the degree to which populations could be sustained on shellfish and estuarine resources (Lightfoot 1997). Recent archaeology including exploration of the deepest levels of the shellmounds, more detailed analysis of mound constituents, identification of dozens of sites unassociated with mounds, and development of a more accurate chronology and assessment of occupation in the Bay region have led to a more detailed picture of the true complexity of prehistoric lifeways in the Bay. The rich and abundant artifact collections recovered from sites on and near the bayshore demonstrate the affluence of Native American communities living there. Shells and shell beads extracted from the bay region were exchanged for exotic raw materials obtained from as far as the Napa Valley and the eastern Sierra Nevada, such as obsidian, quartz crystals, schist, chert, shell, cinnabar, ocher, and other materials, clearly indicative of an extensive trading network (Hope et al. 1996).

The current body of archeological evidence indicates that the mounds served multiple purposes as residential places, ceremonial locations, and burial sites with many diverse and complex aspects. Other prehistoric site types recorded in the Project region include lithic scatters, quarries, bedrock mortars or other milling sites, petroglyphs, and isolated burial sites. Together these sites form part of a larger pattern of subsistence and interaction in the prehistoric San Francisco Bay which is being explored in an ever-expanding series of archaeological investigations in the region.

Ethnographic Setting

The planning study area was most recently occupied by Costanoan Indians, a member of the Penutian linguistic family. The word "Costanoan" was derived from a Spanish word meaning coast people or coastal dwellers, who occupied the area roughly from Carquinez Strait and the northern tip of the San Francisco peninsula to the region south of Monterey Bay and east to the Diablo Range (Levy 1978). The Costanoans, also known as the Ohlone, entered the Bay Area approximately 1,500 years ago, coming in from the Delta region and displacing earlier Hokan speakers living there. Archaeologically, this coincides with the Lower Emergent period. Linguistic and archaeological data seem to suggest that Plains Miwok bands held the northern San Joaquin Valley area until some time during the Late Horizon (Wallace 1978). Migration of the Monache caused tribes on the upper portions of the San Joaquin River to spread northwards along the valley floor, resulting in Yokuts displacement of the Costanoans, pushing them westward (Kroeber 1925, 1959). Spanish expeditions in the 18th century encountered Costanoan tribes all along the coastline. The missionization of Coastanoans was disastrous; by 1832, the population had been reduced by approximately 80 percent due to changes in lifestyle and diseases resulting from contact and conflict with Europeans.

Rosenthal (2001) stated that the area probably served an important role in the economy of the local Ohlone. Waterfowl and small schooling fish would have been available in the sloughs and marshes, while bayward mudflats probably served as important localities for gathering shellfish. Tules, sedges, and other marsh plants which grew along the fresh and brackish-water streams and sloughs were probably used for house construction, basketry material and for a variety of other purposes. Among the better documented Ohlone-speaking groups, the principle village was known to be the home of the triblet's chief, who attained his or her position through patrilineal inheritance. Typically, the office was passed father to son, but when no male heir existed, the position was given to a man's sister or daughter (Levy 1978). Accession to chief typically required approval of the entire community. Acting as the leader of a council of elders, it was the Chief's responsibility to provide for visitors and the impoverished, direct ceremonial activities, and to arrange hunting, fishing, gathering, and warfare expeditions (Levy 1978).

The most common type of house described ethnographically was a dome-shaped structure constructed of willow poles and thatched with tule, grasses, ferns, or wild alfalfa (Kroeber 1925, Levy 1978). Tule was also employed in making clothing and to construct the balsas used to cross San Francisco Bay and maneuver among the marshes and streams surrounding the bay. The balsas were propelled by a double-bladed paddle and were used as transportation and for hunting water fowl and perhaps sea mammals. Sinew-backed bows were made by the Ohlone, and used with arrows tipped by either stone or bone points. Nets were employed to hunt a variety of ducks, quail, rabbits, and, along with basketry traps, to capture the small schooling fish common to the bay-estuary (Kroeber 1925, Levy 1978).

Historic Setting

Spain claimed California in 1542 though made no moves to occupy any of the territory. The Spanish attitude changed when the Russians and English began showing interest in the region. Spanish explorers came into increasing contact with the Native Americans in the first half of the 1770s as Portola, Fages, Rivera, and Anza led expeditions through the region (Milliken 1995).

In 1776, the San Francisco Presidio and the mission of Our Seraphic Father San Francisco de Asís were begun in Yalamu territory near the northern end of the San Francisco peninsula. Later that year, the mission of Our Seraphic Mother Santa Clara began construction in Tamien territory to the south, and a small civilian settlement was begun near Mission Santa Clara. At first, the local Natives came to see the strange people, technologies, and structures that were being erected. However, cultural differences and misunderstandings almost immediately became felt. The first Indians were killed in the fall of 1776 after some Spanish items were stolen, the Yelamu shot an arrow near a soldier, and tried to kiss a Spanish woman (Milliken 1995). Similar violence erupted a year later in Santa Clara.

During the first two years of the missions' existence, most of their converts came from within short walking distance. Larger groups from farther away only began visiting the missions after the Spanish had established control of the immediate territory. The missionaries offered miracles and wonder to the Indians, giving them an opportunity theoretically to join in this new way of life (Milliken 1995). After moving to a mission, Indian life changed dramatically to regimented days spent in the fields, mixing with people from other tribes, isolation from family members of the opposite sex, diseases, and a complete inability to change their situation. Runaways were brought back by the military. In spite of these factors, increasing numbers of Indians came to the missions, particularly in the 1790s. Towards the turn of the century, some of the more distant tribes tried to organize resistance to the missionization effort but these efforts were defeated by the Spanish soldiers (Milliken 1995).

Mexico achieved independence from Spain in 1821 and in 1822 California was declared a territory of the Mexican republic. In 1834, the Mexican government secularized the missions and divided their land holdings into ranchos; the planning study area was within one such rancho, the Rincon de los Esteros (Beck and Haase 1974). During the 1830s and 1840s, new settlers from the United States arrived in California and commercial activity between the United States and California increased. Settlers in search of large expanses of land or trappers and mountain men in search of fur-bearing animals began to occupy California in large numbers. Tensions between the settlers and Native Americans escalated during the Mexican War in 1846. The war ended with the signing of the Treaty of Guadalupe Hidalgo in February of 1848 and the cession of California to the United States.

James Marshall's gold discovery in Coloma in 1848 led to an influx of miners, prospectors, and settlers into California looking for their fortune. Though the Gold Rush was concentrated on the mining country, the Bay Area attracted merchants and settlers looking to capitalize upon California's emerging maritime and agricultural economies. The Gold Rush had a large impact on San Francisco as the city became the main port, transportation hub, and commercial center for the new settlers coming to work in the mines. As the city grew, the transportation network throughout the region also improved and expanded.

Prior to the 1860, the main form of transportation throughout the San Francisco region was either by boat or stagecoach. The first roads in the South Bay were constructed in the mid-19th century and these roads were primarily used to transport agricultural products to market (Jones & Stokes 2001). A maritime transportation network grew up around the economy of the Bay Area to facilitate the movement of agricultural products. The Port of Alviso was one of the earliest ports in the Bay Area. The agricultural activity of the Santa Clara Valley increased the need for an active shipping port in the mid-19th century and Alviso filled this role. By 1861, a steamboat company and four sail companies operated out of Alviso (Jones & Stokes 2001). Other shipping centers developed in the Bay Area such as Redwood City and Union City, which became active commercial and industrial ports. Additional access to the ports and points inland was provided by the development of the railroads.

In 1864 the construction of the San Francisco-San Jose Railroad and the organization of the Southern Pacific Railroad Company created a direct link between the communities in the South Bay and San Francisco. The railroad also spurred the development of new towns. For example, C. B. Polhemus laid out San Mateo after the railroad was constructed. San Mateo became a place for people to build vacation and weekend homes outside of San Francisco. In 1868 the leaders of the Central Pacific Railroad Company, Collis Huntington, Charles Crocker, Mark Hopkins, and Leland Stanford (known as the "Big

Four") acquired the Southern Pacific Railroad in an effort to eliminate competition. In 1869, the Southern Pacific line was extended from San Jose to Gilroy. The Southern Pacific grew quickly and absorbed the original Central Pacific Railroad in 1899.

In 1849 the community of Alviso was laid out by surveyor Chester S. Lyman. Lots were put up for sale at the price of $600 (Munro-Fraser 1881) and the plan was for Alviso to become a large, active shipping and commercial center. In 1850 regular steamboat service between San Francisco and Alviso was established at a cost of $35 per trip (Butler 1981). During the 1850s, Alviso became the major north-south passenger and freight link between San Francisco and the South Bay area. From the dock, a stagecoach would take travelers to San Jose. The importance of Alviso along this transportation corridor led to the development of docks, warehouses, and homes in Alviso. In 1852, Alviso incorporated and became one of the first cities in California. By 1864, the new San Francisco-San Jose Railroad (Southern Pacific Railroad) bypassed Alviso and the town began to decline. In 1876 the South Pacific Coast Railroad was built and did stop in Alviso, but residents and business owners resisted the construction of a depot as they blamed the railroad for the town's downfall (Butler 1981).

In 1890, an entrepreneur named P. H. Wheeler attempted to capitalize on the location of Alviso and the growth of California during the late 19th century. Wheeler devised a plan for a community known as New Chicago, to be located in Alviso. Wheeler had acquired a bankrupt watch factory near San Diego and he proposed New Chicago as the home for this company to be known as the San Jose Watch Factory. On the north side of Alviso, 4,000 lots were laid out and street names, such as State, Wabash, Dearborn, and LaSalle, were borrowed from downtown Chicago. Wheeler's vision was for a new city based upon diversified industries, foundries, iron works, sugar refineries, clothing mills, wineries and car shops. Advertisements in the San Jose Daily Mercury described New Chicago as "The Coming Manufacturing Center of California" (Tvedt 1975). Wheeler's vision of a bustling city was not realized as new industries did not locate in the area. By the summer of 1890, interest in New Chicago had waned as no new businesses opened other than the San Jose Watch Factory.

Some industrial development came to Alviso in the early 20th century. In 1906 Thomas Foon Chew opened the Bayside Canning Company (Kyle 2002). By 1921, the Bayside Canning Company was the third-largest in the United States. Chew used a canning technique that retained the crispness and freshness of asparagus and he became known as the Asparagus King. The Bayside Canning Company was Alviso's most successful operation and it employed hundreds of workers. Many of the workers lived in company owned housing nearby. Chew passed away in 1931 and the cannery slowed production during the Great Depression; in 1936 the cannery closed.

Some redemption arrived in the form of new industry. In 1929 the Alviso Salt Company dredged the tideland to create the salt evaporation ponds located there today. The company constructed levees and harvested the salt, and was almost immediately acquired by the Arden Salt Company (Watt 2005). Today, much of Alviso's downtown is listed in the NRHP as part of an historic district.

Project Area

Background Research

Background research, in the form of a record search performed by the Northwest Information Center (NWIC) of the California Historical Research Information System in Rohnert Park, was conducted in July 2006 for the SBSP Restoration Project, which is located adjacent to the Project site. No project-specific archaeological field inventories were performed as part of this effort. The purpose of the NWIC search was to determine whether there were previously recorded cultural resources and if archaeological surveys had been previously conducted within the planning study area.

The NWIC search included examination of information resources such as:

- Office of Historic Preservation Historic Property Directory
- California Inventory (1996)
- California Historic Landmarks (1996)
- National Register of Historic Places (2000 and updates)
- California Points of Historical Interest (1992 and updates)
- Historic Maps

The earliest historic maps and records cited above depict the southern San Francisco Bay shoreline as a relatively continuous series of salt marshes. Beginning in the mid-19th century, development of the salt industry began in the region.

Results

The NWIC record search results indicated that there are four historic-era cultural resource sites within the Project area. No prehistoric cultural resources have been identified; the four historic-era resources are:

- SCL-339H, the Bayside Cannery Warehouse. This structure is located within the Port of Alviso Historic District but was not identified in the nomination form. The Bayside Cannery consists of a complex of buildings in varying degrees of preservation and may be a contributing element to the Alviso Historic District.
- SCL-801H, the remnants of a World War II shipyard located on the eastern edge of Pond A8, along Alviso Slough. The site consists of the very disturbed remnants of a historic ship building facility at the Port of Alviso, which operated during WWII. Most of the building materials appear to have been salvaged after the facility closed. Concrete crane footings and floors, piers, and a boat ramp still remain.
- P-43-001278, the (now) Union Pacific rail line crosses Alviso north to south. This segment is structurally modern; however, the alignment appears to have been in operation since 1877, when it was part of the Southern Pacific.
- P-43-001468 is the Port of Alviso Historic District itself, also known as the Embarcadero de Santa Clara. The Port began serving southern San Francisco Bay in the 19th century. It was added to the National Register in 1973 and consists of 90 acres and 11 buildings.

3.12.3 Environmental Impacts and Mitigation

Overview

The Project region has been altered by numerous prehistoric and historic uses of the area, and this has marked the landscape. Analysis of the remnants of these past uses is framed within the regulatory criteria enumerated above. When a cultural resource is identified and found to have potential eligibility for listing to the CRHR or NRHP, impacts resulting from a proposed Project must then be evaluated. If an impact resulting from a Project is found to be significant then that Project is considered to have a significant impact on the environment.

Significance Criteria

Under NHPA, if it is determined that historic properties may be affected by an undertaking, the agency proceeds with the Section 106 process, assessing adverse effects. The criteria of adverse effects are found in Section 800.5(a)(1) of the regulations of NHPA. The criteria of adverse effect state:

An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

Adverse effects on historic properties include, but are not limited to:

- Physical destruction of or damage to all or part of the property;
- Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with The Secretary of Interior's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;
- Removal of the property from its historic location;
- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- Neglect of a property that causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and
- Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

In accordance with the State CEQA Guidelines, a significant cultural resources impact would occur if the Project would:

- Cause a substantial adverse change in the significance of a unique archaeological resource or an historical resource as defined in Section 21083.2 of CEQA and Section 15064.5 of the State CEQA Guidelines, respectively; or
- Disturb any human remains, including those interred outside of formal cemeteries.

The State CEQA Guidelines (CCR Section 15064.5) define "substantial adverse change" as physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings.

Impacts & Mitigation

The impacts analysis in this ~~Draft~~ Final EIR evaluates five action alternatives and the required No Project alternative. The action alternatives include vegetation removal and/or dredging, as described in Chapter 2. Under the No Project alternative, the District would not take any action in the Project area and existing programs would continue. The analysis covers impacts from the construction and maintenance phases–both in the slough and at staging areas.

All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by BCDC, CSLC, the District, or SBYC by the time of commencement of construction of this Project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Table 3.12-2 lists each impact identified for the proposed alternatives, along with the significance of each impact. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (less than significant and does not require mitigation), or Class IV (beneficial). Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections.

The following impacts and mitigation measures are based on the information collected from the NWIC record search, as well as an assessment of the likelihood that similar as-yet unknown resources may be identified during project construction. The impacts and mitigation measures below are generally discussed using CEQA language such as "significant impacts" rather than "adverse effects."

Table 3.12-2 Impact and Mitigation Summary

Impact	Impact Significance	Mitigation Measures
Impact CUL-1: Impacts to Known Cultural Resources.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact CUL-2: Impacts to As-Yet Unknown Cultural Resources including human remains.	Alts. 1-5: Class II	CUL-A CUL-B
	Alt. 6: No Impact	--
Note: The impacts and mitigation would be the same both with and without the SBSP Restoration Project.		

This discussion includes consideration of resources under the NHPA as well as CEQA, but without offering the confusion of using two sets of similar terminology. As a reminder, cultural resources may be historic or prehistoric. The word "historic" may be a temporal reference, or it may signify the importance of a resource from either the historic or prehistoric era. A historic resource, as defined by CEQA, is a site that is eligible or potentially eligible for listing in the CRHR. The reader must follow the context of the discussion to understand which use of the word is being made.

Impact CUL-1: **Impacts to Known Cultural Resources.**

There are four known historic-era resources in the vicinity of the Alviso Slough Restoration Project. Only one of these has been evaluated for potential eligibility to the CRHR and NRHP; of the four, only the Alviso Historic District has been found eligible for listing. However, none of the Project alternatives would physically impact the Alviso Historic District. Construction of the alternatives (except Alternative 6) would be visible from the Alviso Historic District; however, the construction activities would not have an adverse effect on the Historic District. Therefore, there would be a less than significant impact to known cultural resources from the proposed project, as described for each alternative below.

Alternative 1: Vegetation and Root Mass Removal (2.6 acres) to four-foot depth

The vegetation and root mass removal and dredging proposed in this alternative would occur on the east side of Alviso Slough. All of the action alternatives include the removal of navigational hazards from the Project Area, including abandoned vessels, unused docks, and sunken vessels or debris. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

There are no known cultural resources in this area. Therefore, this impact is considered **Less than Significant.**

Alternative 2: Vegetation and Root Mass Removal (7.0 acres) to four-foot depth

This alternative is similar to Alternative 1 except that it would involve vegetation and root mass removal on both sides of Alviso Slough. This alternative would likely include disturbances to the World War II shipyard remnants at site CA-SCL-801H; however, this site has been severely disturbed over time, and what little remains of the facility has already been documented on appropriate California site record forms. Construction of this alternative would not result in any significant impacts to what remains of the shipyard. This impact is considered **Less than Significant.**

Alternative 3: Vegetation /Root Mass Removal and Shallow Dredging (3.7 acres) to eight-foot depth

This alternative would involve vegetation and root mass removal on the east side of Alviso Slough as well as deeper dredging. There are no known cultural resources in this location. This impact is considered **Less than Significant.**

Alternative 4: Vegetation/Root Mass Removal and Deep Dredging (6.2 acres) to 16-foot depth

This alternative would involve vegetation and root mass removal on both sides of Alviso Slough as well as deep dredging. As in Alternative 3, Alternative 4 would likely include disturbances to the World War II shipyard remnants at site CA-SCL-801H; however, this site has been severely disturbed over time, and what little remains of the facility has already been documented on appropriate California site record forms. Construction of this alternative would not result in any significant impacts to what remains of the shipyard. This impact is considered **Less than Significant.**

Alternative 5: Vegetation and Root Mass Removal (15.3 acres) to four foot depth and Dredging (9.7 acres), to 10 feet below existing grade

This alternative would involve vegetation and root mass removal on both sides of Alviso Slough as well as deep dredging to 10 feet. This alternative would likely include disturbances to the World War II shipyard remnants at site CA-SCL-801H; however, this site has been severely disturbed over time, and what little remains of the facility has already been documented on appropriate California site record forms. Construction of this alternative would not result in any significant impacts to what remains of the shipyard. This impact is considered **Less than Significant.**

Alternative 6: No Project

Under the No Project Alternative, there would be no changes to the current landscape. Because the Project would not be implemented under the No Project Alternative, no restoration-related construction activities would occur that could affect known cultural resources, and there would be **No Impact.**

Impact CUL-2: **Impacts to As-Yet Unknown Cultural Resources including human remains.**

Intensive prehistoric occupation and use of the San Francisco Bay region has been documented over the course of the last hundred years. Site types ranging from small lithic scatters to massive shell middens have been noted throughout the region, and a propensity for locations along drainages is well-known. Because of natural soil accumulation as well as massive deposition resulting from Gold Rush-era placer mining, these early sites may be buried below Bay mud and fill. Subsurface excavation related to constructing any of the restoration alternatives (including replacement of damaged or displaced active piers) might uncover these types of sites and if they are evaluated and found eligible for listing on either the CRHR or the NRHP, then project-related impacts to these resources would be significant.

Intensive prehistoric occupation and use of the San Francisco Bay region has been documented over the course of the last hundred years. Numerous sites that include Native American human remains have been noted throughout the region. Because of natural soil accumulation as well as massive deposition resulting from Gold Rush-era placer mining, burial sites may be buried below Bay mud and fill. Subsurface excavation related to construction of the alternatives has a potential to uncover burials.

A burial site may be eligible for listing on the CRHR or the NRHP; if so, then impacts to such a site would be significant and would require appropriate mitigation.

Alternatives 1, 2, 3, 4, and 5

Because this Project would require subsurface disturbance, there is the potential to uncover buried cultural resources including human remains. These resources may be eligible for listing on the CRHR or the NRHP; if they were, then impacts to them would be significant and would require appropriate mitigation. In summary, there may be as-yet unknown cultural resources uncovered during construction related to Alternatives 1 through 5 and impacts to these resources are considered **Less than Significant with Mitigation.**

- **Mitigation Measure CUL-A: Preconstruction Worker Education and Consultation if Resources are Encountered.**

  If evidence of archaeological or historic-era resources is uncovered during Project construction, work in the vicinity of the find shall be halted until the discovery can be evaluated and treated.

  Before the start of construction activities or ground disturbing activities associated with the project, a professional archaeologist who meets the Secretary of the Interior's Standards and Qualifications shall alert all construction personnel to the possibility of finding buried cultural resources during subsurface excavation. If artifacts or unusual amounts of stone, bone, or shell are uncovered during construction activities, work within 50 feet of the specific location at which the suspected resources have been uncovered shall be suspended, and the District shall be immediately contacted. At that time, the District shall retain a professional archaeological consultant who meets the Secretary of the Interior's Standards and Qualifications who shall conduct a field investigation of the specific site and recommend mitigation deemed necessary for the protection or recovery of any cultural resources concluded by the archaeologist to represent significant or potentially significant resources (as defined by CEQA). If the cultural resource is determined to be a historic property as defined by the NHPA, potential adverse effects resulting from the proposed Project shall be resolved in consultation between SHPO, the ACHP, and interested parties. The lead agency shall ensure that the mitigation is implemented before the resumption of construction activities at the location of the find.

- **Mitigation Measure CUL-B: Stop Work If Human Remains are Uncovered.** If evidence of human remains is uncovered during Project construction, work in the vicinity of the find shall be halted until the burials can be evaluated and treated.

  In accordance with the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, the contractor shall immediately halt potentially damaging excavation within 50 feet of the burial and notify the District; the District shall notify the Santa Clara County Coroner and a professional archaeologist to determine the nature of the remains. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or state lands (Health and Safety Code Section 7050.5[b]). If the coroner determines that the remains are those of a Native American, he or she must contact the Native American Heritage Commission (NAHC) by phone within 24 hours of making that determination (Health and Safety Code Section 7050[c]). Following the coroner's findings, the property owner, contractor or Project proponent, an archaeologist, and the NAHC-designated Most Likely Descendent (MLD) shall determine the ultimate treatment and disposition of the remains and take appropriate steps to ensure that additional human interments are not disturbed. The responsibilities for acting upon notification of a discovery of Native American human remains are identified in California Public Resources Code Section (PRC) 5097.9.

  Upon the discovery of Native American remains, the landowner shall ensure that the immediate vicinity (according to generally accepted cultural or archaeological standards and practices) is not damaged or disturbed by further development activity until consultation with the MLD has taken place. The MLD shall have 48 hours to complete a site inspection and make recommendations after being granted access to the site. A range of possible treatments for the remains, including nondestructive removal and analysis, preservation in place, relinquishment of the remains and associated items to the descendents, or other culturally appropriate treatment may be discussed. PRC 5097.9 suggests that the concerned parties may extend discussions beyond the initial 48 hours to allow for the discovery of additional remains. The following is a list of site protection measures that the landowner shall employ:

(1) Record the site with the NAHC or the appropriate Information Center

(2) Utilize an open-space or conservation zoning designation or easement

(3) Record a document with the county in which the property is located

The landowner or their authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance if the NAHC is unable to identify a MLD or the MLD fails to make a recommendation within 48 hours after being granted access to the site. The landowner or their authorized representative may also re-inter the remains in a location not subject to further disturbance if they reject the recommendation of the MLD, and mediation by the NAHC fails to provide measures acceptable to the landowner. Adherence to these procedures and other provisions of the California Health and Safety Code will reduce potential impacts to human remains to a less-than-significant level.

Implementation of Mitigation Measures CUL-A and CUL-B would reduce project-related impacts to as-yet unknown cultural resources including human remains to a less than significant level.

Alternative 6: No Project

Under the No Project Alternative, there would be no changes to the current landscape. Because the Project would not be implemented under the No Project Alternative, no construction activities would occur that could affect as-yet unknown cultural resources. Therefore, there would be **No Impact.**

3.12.4 Relationship to South Bay Salt Ponds Phase 1 Action at Pond A8

The impacts and mitigation identified above would be the same with or without the Phase 1 Action at Pond A8.

3.12.5 Sediment Disposal Options

Sediment disposal options include trucking, barging, or conveying (e.g., by slurry pipeline) the dredged sediment to a location where it could be re-used, rather than trucking the material to the Newby Island Landfill, as described in Chapter 2. These disposal options would result in similar impacts to cultural resources as considered above and would require the same mitigation measures. Construction of a slurry pipeline atop levees may require additional mitigation measures to avoid resources.

3.13 TRANSPORTATION AND TRAFFIC (TRANS)

This section describes the existing transportation network, including roadways which provide access to the Alviso Slough Restoration Project area. It also includes a summary of the physical setting, at regional and project levels, as well as the regulatory setting and an impacts and mitigation section that evaluates the potential impacts associated with implementation of the Alviso Slough Restoration Project. Background information was drawn from applicable regional and local general plans and policies.

3.13.1 Regulatory Setting

This section provides the regulatory background necessary to analyze the effects on transportation and traffic associated with the Alviso Slough Restoration Project. Applicable local and regional plans and policies were reviewed for information on existing land uses and policies.

Operating characteristics of intersections are described by the concept of Level of Service (LOS). LOS is a qualitative description of an intersection's performance based on the average delay per vehicle. Intersection levels of service range from LOS A, which indicates free flow or excellent conditions with short delays, to LOS F, which indicates congested conditions with extremely long delays. LOS A through D are considered acceptable LOS (excellent to satisfactory) service levels. LOS E is generally considered undesirable, and LOS F conditions are considered unacceptable.

Table 3.13-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
FEDERAL	
None	
STATE	
None	
LOCAL	
Santa Clara County *Santa Clara County General Plan, Policy C-TR 12*	The County's network of roads consists of nine highways (101, 880, 280, 680, 17, 85, 87, 152 and 237), and eight expressways (Almaden, Capitol, Central, Foothill, Lawrence, Montague, Oregon, and San Tomas). It is the goal of this plan to achieve a LOS no lower than D at peak travel periods on city streets, county roads, expressways and state highways. However, in certain instances, a lower level of service may be acceptable when LOS D can not practically be achieved.[1] The proposed haul route would utilize portions of State Route (SR) 237 and Interstate (I) 880.
City of San Jose *City of San Jose General Plan 2020*	The minimum overall performance of City streets during peak travel periods should be LOS D.[2] Development proposals should be reviewed for their measurable impacts on the level of service and should be required to provide appropriate mitigation measures if they have the potential to reduce the level of service to E or worse. These mitigation measures typically involve street improvements. When the mitigation for vehicular traffic compromises community livability by removing street trees,

---

[1] Santa Clara County, Santa Clara County General Plan, Transportation Element, p. F-18, 1994.

[2] City of San Jose, San Jose General Plan 2020, Chapter 4: Goals and Policies, p. 89, 2004.

Agency + Plan or Policy	Overview & Applicability
	reducing front yards, or creating other neighborhood impacts, then improvements to transit, bicycle, or pedestrian facilities may be considered in combination with more appropriate street improvements to meet the LOS standard.
City of San Jose Department of Public Works *Haul Route Permit, Encroachment Permit, and Traffic Control Plan*	A haul route permit is required for projects importing or exporting more than 10,000 c.y. of earth. The permit application requires a description of the requested route(s) to/from the project site and haul route destination. Encroachment permits are used to allow construction work in the public right-of-way. These permits typically require a plan showing the work proposed, as well as fees and surety to insure the completion of the work. This permit would be required only if the construction area cannot be contained within the identified staging areas. The Department of Public Works requires the preparation of a traffic control plan to allow contractors to work within the public right-of-way efficiently and effectively while maintaining a safe, uniform, flow of traffic. The construction work and the public traveling through the work zone in vehicles, bicycles or as pedestrians must be given equal consideration when developing a traffic control plan.
City of San Jose – Alviso Specific Plan *Major Collector Roads – Definition and Use*	Alviso has four major collector roads (defined as 60 to 90 feet in width): Zanker Road, Grand Boulevard, Los Esteros Road, Gold Street, and the portion of North 1st Street from Grand to Gold Street. Major Collector roads serve internal traffic within Alviso and connect to arterial streets, which accommodate major movement of traffic and are designed mainly for the movement of through traffic, such as traffic to/from the highway. The proposed haul route would maximize the use of the Major Collector Roads within the community of Alviso to limit truck traffic on smaller local streets.
California Department of Transportation (Caltrans) *Transportation Permit, Haul Route Permit, Encroachment Permit.*	The use of California State highways for other than normal transportation purposes may require written authorization from the Department of Transportation. As the responsible Department for protecting the public's investment in the State highway system, Caltrans reviews all requests from utility companies, developers, volunteers, nonprofit organizations, etc., desiring to conduct various activities within the right of way. The Transportation Permits Branch is responsible for the administration of the Transportation Permit program through the uniform issuance of Transportation Permits.
Santa Clara VTA *Congestion Management Agency*	The Santa Clara Valley Transportation Authority (VTA) is an independent special district responsible for bus and light rail operations, congestion management, specific highway improvement projects, and countywide transportation planning. As such, VTA is both a transit provider, and a multi-modal transportation planning organization involved with transit, highways and roadways, bikeways, and pedestrian facilities. VTA also serves as the Congestion Management Agency for Santa Clara County. In this role VTA makes decisions on what local projects can utilize federal and state funding, and manage sales tax revenue that is specified for VTA usages, such as 1987 Measure A and 2000 Measure A sales tax measures.

3.13.2 Physical Setting

The Alviso Slough Restoration Project area is located near the southern tip of San Francisco Bay. The transportation network in and around San Francisco Bay consists of state highways, surface streets, railways, public transit systems, and air systems. A series of highways rings the Bay, with interconnections provided by bridges crossing the open water.

Regional

Major north-south trending roadways in the Alviso Slough Restoration Project area region include:

- I-880, which extends along the east side of the Bay and connects I-80 in Oakland to SR 17 in San Jose. I-880 is located east of the Alviso Slough Restoration Project area;
- US Highway 101 (US 101), which extends along the west side of the Bay and travels the length of California from the Oregon border to the Mexico border. US 101 extends along the peninsula and south of the Alviso Slough Restoration Project area;
- I-280, which extends along the west side of the Bay. I-280 originates in San Francisco and trends south through San Jose, where it connects to I-680; and
- I-680, which originates from north of Suisun Bay to the junction with I-280 in the South Bay.

Major east-west trending highways and bridges that provide connections to the communities on both sides of the Bay include:

- SR 84, which originates from I-880 in the East Bay and crosses the Bay via the Dumbarton Bridge to San Gregorio. SR 84 passes to the north of the Alviso Slough Restoration Project area; and
- State Route 237 (SR 237), which originates from I-680 in Milpitas and runs south of San Francisco Bay to its connection with SR 85 in Sunnyvale. SR 237 passes south of the Alviso Slough Restoration Project area.

A number of airports are located around the Bay, including the San Francisco International Airport, Oakland International Airport, and the Mineta San Jose International Airport. Smaller private and public airports are scattered throughout the Bay Area cities, including Moffett Federal Airfield located approximately four miles west of the Project site. The Santa Clara VTA operates buses and light rail that serve the urbanized portions of Santa Clara County.

Project Area

The local traffic network consists of arterial streets, collector streets, and local streets. Typically, arterial streets accommodate through traffic and are located around rather than through residential neighborhoods, commercial centers, and industrial areas. Collector streets supplement and provide access to arterial streets and provide access to neighborhoods; on such streets, the needs of through traffic and turning and parking must be balanced. Local streets primarily provide access to abutting properties; ease of access, pedestrian safety, and parking have priority over traffic movement. Major collector streets that provide access to the Project site via several smaller residential streets include Gold Street and North 1st Street.

The primary access to the Project area is provided by US 101 or SR 237 and surface streets. In 2005, traffic volumes for US 101, between Moffett Blvd. and SR 85 (west of, but the closest location to the Alviso Slough), were 11,000 vehicles during the peak hour and 164,000 peak month Average Daily Traffic (ADT) (Caltrans 2005). In 2005, the traffic volumes for SR 237, between the Great America Parkway and North 1st Street (the closest location to the Slough, south of the community of Alviso), was 10,200 vehicles during the peak hour, and 137,000 peak month ADT (Caltrans 2005).

Access to the Project site is provided from SR 237, and local streets including North 1st and Grand Boulevard (which provide access to the nearby Refuge), Caribbean Drive (to Sunnyvale Baylands Park), and North Shoreline Boulevard (to the Mountain View Shoreline Park).

No local or regional (e.g., VTA) transit bus lines travel directly to the Project site. Several bus routes travel along streets south of the pond complex, including Routes 120, 122, 104, 40, and 51 (Santa Clara Valley Transportation Authority 2006). Although no bus routes travel directly to the Project site, bus Route 58 serves the Alviso community via North 1st Street.

The UPRR right-of-way passes close to the Project site, paralleling El Dorado Street at its closest point to Alviso Slough. If the alternate haul routes identified in Figure 2-7 and 2-8 are advantageous, coordination with the railroad company would be necessary to ensure there is no impact to rail operations.

Intersection Level of Service Evaluation

Weekday AM and PM peak period (7:00-9:00 a.m. and 4:00-6:00 p.m.) traffic volumes were counted by Crane Transportation Group on December 19, 2007 at the following intersection locations:

- I-880 Northbound Ramps/Dixon Landing Road (City of Milpitas)
- I-880 Southbound Ramps/Dixon Landing Road (City of Milpitas)
- SR 237 Eastbound Ramps/Great America Parkway (City of San Jose)
- SR 237 Westbound Ramps/Great America Parkway (City of San Jose)
- SR 237 Eastbound Ramps/N. 1st Street (City of San Jose)
- SR 237 Westbound Ramps/N. 1st Street (City of San Jose)
- SR 237 Eastbound Ramps/Zanker Road (City of San Jose)
- SR 237 Westbound Ramps/Zanker Road (City of San Jose)
- Gold Street/Great America Parkway Connector Road (City of San Jose)

In general, the AM peak hour at the majority of locations was 8:00 to 9:00 a.m., while the PM peak hour was 5:00 to 6:00 p.m.

Table 3.13-2 below shows the existing LOS at each of the intersections. Year 2010 was selected as the near term horizon evaluation year for the base case as it corresponded to the first year of likely project operation. All year 2007 intersection peak hour volumes were increased at a rate of two percent per year (or a six percent increase) to 2010.

Table 3.13-2 Intersection Level of Service - Existing and Base Case

Intersection	AM PEAK HOUR		PM PEAK HOUR	
	Existing	Base Case (2010)	Existing	Base Case (2010)
Great America Pkwy/SR 237 EB Ramps	A 7.5(1)	A 7.6	A 8.1	A 8.2
Great America Pkwy/SR 237 WB Ramps	B 14.4(1)	B 15.5	B 12.4	B 12.5
Gold St./Great America Pkwy Connector Rd.	B 12.2(1)	B 12.3	B+ 12.0	B 12.1
Dixon Landing Rd./I-880 SB Ramps	B 14.5(1)	B 14.7	B 15.3	B 15.5
Dixon Landing Rd./I-880 NB Ramps/California Circle	B- 19.9(1)	C+ 20.6	C+ 22.7	C 24.1
No. 1st St./SR 237 EB Ramps	B 17.4(1)	B 17.7	B 14.4	B 14.5
No. 1st St./SR 237 WB Ramps	B 12.6(1)	B 12.7	B 15.6	B 15.9
Dixon Landing Rd./I-880 SB Ramps	B 14.5(1)	B 14.7	B 15.3	B 15.5
Dixon Landing Rd./I-880 NB Ramps/California Circle	B- 19.9(1)	C+ 20.6	C+ 22.7	C 24.1
Zanker Rd./SR 237 EB Ramps	B+ 11.7(1)	B+ 11.9	A 7.4	A 7.5
Zanker Rd./SR 237 WB Ramps	A 6.7(1)	A 6.7	A 7.6	A 7.7
Dixon Landing Rd./I-880 SB Ramps	B 14.5(1)	B 14.7	B 15.3	B 15.5
Dixon Landing Rd./I-880 NB Ramps/California Circle	B- 19.9(1)	C+ 20.6	C+ 22.7	C 24.1

Notes:

(1) Signalized level of service – average vehicle control delay in seconds

LOS E is the minimum acceptable operation for Santa Clara VTA and City of San Jose (all ramp intersections along the SR 237 freeway are included in the Congestion Management Program monitoring – at Great America Parkway, N. 1st Street and Zanker Road). LOS D is the minimum acceptable operation for the City of Milpitas and the City of San Jose.

Year 2000 Highway Capacity Manual Analysis Methodology; TRAFFIX software program with VTA adjustments.

Source: Crane Transportation Group

All analysis intersections are currently operating acceptably at LOS A, B or C conditions during the AM and PM peak traffic hours. In addition, all analysis intersections would operate acceptably at LOS A, B or C conditions during the AM and PM peak traffic hours in 2010 volumes.

Freeway Segment Level of Service Evaluation

Freeway segments have been evaluated using the year 2000 Highway Capacity Manual (HCM) analysis methodology as adjusted by the Santa Clara VTA Congestion Management Program. The HCM method for evaluating LOS of freeway segments is based on density, expressed as passenger cars per mile per lane (pcpmpl). The density values for the LOS A/B , B/C and C/D thresholds are based on values from HCM 2000. The LOS D/E and E/F thresholds are based on Santa Clara County conditions and are slightly different from those in the HCM 2000.

The Santa Clara VTA minimum acceptable standard for freeway operation is LOS E. Caltrans' *Guide for the Preparation of Traffic Impacts Studies* (December 2002) is intended to provide a consistent basis for evaluating traffic impacts to state facilities. Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D. However, on state highway facilities Caltrans acknowledges that maintenance of the target LOS may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS.[3]

All year 2006 freeway volumes were increased at a rate of 0.5 percent per year to 2010 (or a two percent increase). Freeway volume increases were based upon historical Caltrans traffic count information for the SR 237 and I-880 freeways between 1999 and 2006. No historic traffic count data was available for local intersections, so a higher, more conservative increase was utilized.

Table 3.13-3 below shows the existing and base case freeway densities and freeway segment LOS in the Project area.

Table 3.13-3 Freeway Segment Level of Service – Existing and Base Case

Location	Existing				Base Case (2010)			
	AM Volume	LOS	PM Volume	LOS	AM Volume	LOS	PM Volume	LOS
I-880 Between SR 237 & Dixon Landing Rd.								
Northbound	35	D	112	F	36	D	114	F
Southbound	45	D	23	C	46	D	24	C
SR 237 – I-880 to Zanker Rd.								
Eastbound	26	C	42	D	27	D	43	D
Westbound	147	F	94	F	150	F	96	F
SR 237 – Zanker Rd. to N. 1st St.								
Eastbound	44	D	69	F	45	D	71	F
Westbound	64	F	54	E	65	F	55	E
SR 237 – N. 1st St. to Great America Pkwy.								
Eastbound	47	E	94	F	48	E	96	F
Westbound	43	D	38	D	44	D	39	D
Source: Santa Clara VTA 2006 Monitoring and Conformance Report/Crane Transportation Group								

As shown, SR 237 is currently operating unacceptably at LOS F during the AM peak hour in the westbound direction between I-880 and N. 1st Street. During the PM peak hour, it is operating unacceptably at LOS F in the eastbound direction between Great America Parkway and Zanker Road, and in the westbound direction between I-880 and Zanker Road. I-880 is currently operating unacceptably at LOS F during the PM peak hour in the northbound direction. Under 2010 conditions, SR 237 would operate unacceptably at LOS F during the AM peak hour in the westbound direction between I-880 and N. 1st Street. During the PM peak hour, it would operate at LOS F in the eastbound direction between Great America Parkway and Zanker Road, and in the westbound direction between I-880 and Zanker Road. I-880 would operate unacceptably at LOS F during the PM peak hour in the northbound direction under base case conditions.

---

[3] California Department of Transportation, December 2002, *Caltrans Guide for the Preparation of Traffic Impact Studies*.

3.13.3 Environmental Impacts and Mitigation

Overview

This section includes an analysis of potential short term (during vegetation and root mass removal activities) and long term (operation) period traffic impacts. In addition, this section incorporates the analysis of circulation related impacts on local freeways and major intersections associated with the proposed Project truck traffic; the complete traffic impact study conducted by Crane Transportation Group is provided in Appendix F. Mitigation measures are recommended, as necessary, to reduce significant traffic impacts. Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, a significant traffic impact would occur if the Project would:

- Cause traffic operations on a roadway or at an intersection to degrade (e.g., due to increased traffic generated by construction vehicles and/or loss of a travel lane to accommodate the construction work zone);
- Cause a substantial increase in traffic relative to the traffic volume of the local traffic network;
- Result in lengthy delays for transit riders;
- Result in an inadequate parking capacity;
- Substantially impede access to local streets or adjacent uses, including emergency access;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or
- Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

Additional criteria, based on local plans and policies of local and regional jurisdictions, are applicable to this Project. A significant impact to transportation and traffic would occur if the Project would:

- Temporarily or permanently disrupt rail operations;
- Reduce City of San Jose (CMP Intersections at Freeway Ramps) from LOS A, B, C, D, or E operation to LOS F operation;
- Reduce City of Milpitas intersections (Dixon Landing Road/I-880 Ramp Intersections) from LOS A, B, C or D operation to LOS E or F operation; or
- Reduce City of San Jose (Gold Street/Great America Parkway Connector Road Intersection) from LOS A, B, C or D operation to LOS E or F operation.

For freeway segments, an impact is considered significant if project traffic degrades from LOS A, B, C, D or E operation to LOS F operation. If 2010 operation is already LOS E, the impact is considered significant if project traffic is greater than one percent of the freeway capacity. For 2 mixed flow lanes, 1 percent of directional capacity is 44 vehicles per hour. Caltrans considers any traffic added to significantly congested freeway conditions (typically LOS F) as a significant impact.

Impacts & Mitigation

The impacts analysis in this ~~Draft~~ Final EIR evaluates five action alternatives and the required No Project alternative. The action alternatives include vegetation removal and/or dredging, as described in Chapter 2. Under the No Project alternative, the District would not take any action in the Project area and existing programs would continue. The analysis covers impacts from the construction and maintenance phases–both in the slough and at staging areas.

All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by BCDC, CSLC, the District, or SBYC by the time of commencement of construction of this Project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Table 3.13-4 lists each impact identified for the proposed alternatives, along with the significance of each impact. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (less than significant and does not require mitigation), or Class IV (beneficial). Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections.

Table 3.13-4 Impact and Mitigation Summary

Impact	Impact Significance	Mitigation Measures
Impact TRANS-1: Short-term degradation of traffic levels on a roadway or at an intersection due to haul truck traffic.	Alts. 1-5: Class II	TRANS-A
	Alt. 6: No Impact	--
Impact TRANS-2: Addition of haul truck traffic on sections of the San Francisco Bay Trail.	Alts. 1-5: Class III	~~TRANS-B~~
	Alt. 6: No Impact	--
Impact TRANS-3: Increase in wear and tear on the designated haul routes during construction.	Alts. 1-5: Class II	TRANS-C
	Alt. 6: No Impact	--
Impact TRANS-4: Roadway safety hazards associated with haul truck traffic exiting/entering staging areas.	Alts. 1-5: Class II	TRANS-D
	Alt. 6: No Impact	--
Note: The impacts and mitigation would be the same both with and without the SBSP Restoration Project.		

A discussion of short term and long term traffic conditions follows to help the reader relate the Project actions to potential impacts.

Short Term

The Alviso Slough Restoration Project is not anticipated to result in lengthy delays for transit riders, would not disrupt rail operations and would not impede access to local streets or adjacent uses (including emergency access). Construction staging would be accommodated within the Alviso Slough Restoration Project area. As such, the Project would not generate demand for parking outside the boundaries of the site. Therefore, no impacts to parking would occur during construction. No lane or road closures would occur on any roadways as a result of implementation of the proposed Project. The Project would not increase hazards due to design features or incompatible uses. In addition, the Project would not conflict with adopted policies, plans, or programs supporting alternative transportation.

Project implementation would involve the removal of vegetation and root mass along a reach of the Alviso Slough, necessitating ingress and egress of the Project site by mechanical equipment, haul trucks and Project personnel vehicles.

Project related dredging activities would result in daily production of over 1,000 c.y. of dredged material, which would be stored for drying over a period of up to 10 days at various potential staging areas near the Project site (Figures 2-7 and 2-8). Dried sediment would then be transported in 12 c.y. haul trucks to the Newby Island Landfill, located directly west of the I-880 interchange at Dixon Landing Road, about six miles from the Project site. This landfill would limit Project deliveries to 80 trucks per day, and during its operating hours of 6:00 a.m. to 6:00 p.m. Monday through Saturday. 80 round trips per day would result in approximately 5 to 10 truck trips per hour per direction for each type of transport (vegetation/root mass transport and sediment transport). During the local street system peak traffic hour (8:00 to 9:00 a.m.), there would likely be 10 outbound trucks departing for both the Zanker Road landfill (with vegetation) as well as for the Newby Island Landfill accessed via Dixon Landing Road (with sediment). During this same hour there would be five trucks returning to Alviso from each landfill. During the PM peak hour (5:00 to 6:00 p.m.), there would be 5 trucks departing Alviso for each landfill, with 10 trucks returning to Alviso from each landfill.

Vegetation material (dry or wet) would be transported to the Zanker Road Landfill facility, located two miles east of the Project site, for composting. Because the vegetation would be harvested from the slough more quickly than it could be hauled away, staging areas would be required to store the material until it can be hauled to the landfill (Figures 2-7 and 2-8).

Haul trucks loaded at any one of staging areas 1 through 5 destined for the Zanker Road Landfill would travel by one of two routes: (1) enter Taylor Street eastbound at its intersection with Hope Street, proceed as Taylor becomes North 1st Street, make a left at Grand Boulevard, turn right as it becomes Los Esteros Road, and enter the landfill; or (2) from North 1st Street, access SR 237, take the Zanker Road exit and travel northbound as it becomes Los Esteros Road to the landfill. Loaded haul trucks leaving staging areas 1 through 5 destined for the Newby landfill would proceed as described above, but continue on North 1st Street to SR 237 eastbound, merge onto I-880 northbound, exit at Dixon Landing Road and travel westbound on Dixon Landing Road to the landfill.

Haul trucks loaded at staging areas 6 through 10 destined for the Zanker Road Landfill would access SR 237 eastbound, exit at Zanker Road, travel northbound as it becomes Los Esteros Road and enter the landfill. Trucks loaded at staging areas 6 through 10 and destined for the Newby landfill would enter SR 237 eastbound, merge onto I-880 northbound, exit at Dixon Landing Road and travel westbound on Dixon Landing Road to the landfill.

Three scenarios were evaluated in the traffic impact study by Crane Transportation Group to address access to Newby Island Landfill trucks via SR 237:

- Scenario 1: All freeway access via the Great America Parkway interchange
- Scenario 2: All freeway access via the North 1st Street interchange
- Scenario 3: All freeway access via the Zanker Road interchange

As shown on Figures 2-7 and 2-8, other potential material haul routes exist in the immediate vicinity of the Project site. These routes would avoid potential noise and air quality related inconveniences to neighborhood businesses and residents resulting from truck trips to and from the Project site and the various proposed staging areas. However, because these haul routes would require access to private rights-of-way, and it is uncertain whether access to these routes could be secured, these routes would be considered less feasible than the public access haul routes described above.

In addition to haul truck trips, short term traffic trips associated with the Project would also consist of transportation of the worker crew, which would consist of up to 20 to 40 daily one-way trips (assuming 10 to 20 workers on site per day).

Long Term

Over the long term, Project implementation may result in an increased use of Alviso Slough for recreational purposes. Parking in and around Alviso Slough is typically uncomplicated – there are many parking spaces at the Alviso Marina County Park and along the city streets near the SBYC.

This increase in parking demand is not considered significant, primarily because the additional recreation related traffic would occur mostly during weekends and not during weekday AM and PM peak hours, and because any increase in recreation related traffic trips would be minimal. No lane or road closures would occur on any roadways as a result of implementation of the proposed Project. The Project would not increase hazards due to design features or incompatible uses. In addition, the Project would not conflict with adopted policies, plans, or programs supporting alternative transportation.

Impact TRANS-1: **Short-term degradation of traffic levels on a roadway or at an intersection due to haul truck traffic.**

Summary – Common to All Alternatives

Implementation of vegetation and root mass removal activities at Alviso Slough would necessitate the use of haul trucks to remove the material to nearby waste facilities. The presence of these haul trucks, along with vehicles carrying works crews and other material, would cause a short term level of service degradation in the Project vicinity.

Alternatives 1, 2, 3, 4, and 5

Under Alternatives 1, 2, 3, 4, and 5, as many as 160 daily round trip truck trips would be generated, occurring over a period of 19 to 229 working days (see Table 2-2 in Chapter 2). For purposes of the traffic analysis, only peak hour traffic is evaluated. Alternatives 4 and 5 would produce the greatest level of truck traffic at 80 round trips per day for transport of vegetation/root mass 80 round trips per day for transport of sediment. Alternatives 1 to 4 would generate traffic volumes equal or less than Alternative 5. Therefore intersection LOS impacts discussed for Alternative 5 would be the same for Alternatives 1 through 4 under all three scenarios. Table 3.13-5 shows the intersection LOS for 2010 and 2010 with the Project for each of the three scenarios.

Table 3.13-5 Intersection Level of Service and Vehicle Control Delay for 2010 and 2010 with the Project

Intersection	AM PEAK HOUR		PM PEAK HOUR	
	2010	2010 + Project	2010	2010 + Project
SCENARIO 1 (Great America Pkwy Freeway Access)				
Great America Pkwy/SR 237 EB Ramps	A (7.6)	A (7.6)	A (8.2)	A (8.3)
Great America Pkwy/SR 237 WB Ramps	B (15.5)	B (15.5)	B (12.5)	B (12.5)
Gold St./Great America Pkwy Connector Rd.	B (12.3)	B (12.4)	B (12.1)	B (12.1)
Dixon Landing Rd./I-880 SB Ramps	B (14.7)	B (14.7)	B (15.5)	B (15.5)
Dixon Landing Rd./I-880 NB Ramps/California Circle	C+ (20.6)	C+ (20.9)	C (24.1)	C (24.1)
SCENARIO 2 (North 1st Street Freeway Access)				
No. 1st St./SR 237 EB Ramps	B (17.7)	B (17.8)	B (14.5)	B (14.6)
No. 1st St./SR 237 WB Ramps	B (12.7)	B (12.9)	B (15.9)	B (16.1)
Dixon Landing Rd./I-880 SB Ramps	B (14.7)	B (14.7)	B (15.5)	B (15.5)
Dixon Landing Rd./I-880 NB Ramps/California Circle	C+ (20.6)	C+ (20.9)	C (24.1)	C (24.1)
SCENARIO 3 (Zanker Road Freeway Access)				
Zanker Rd./SR 237 EB Ramps	B+ (11.9)	B+ (12.0)	A (7.5)	A (7.6)
Zanker Rd./SR 237 WB Ramps	A (6.7)	A (6.9)	A (7.7)	A (7.7)
Dixon Landing Rd./I-880 SB Ramps	B (14.7)	B (14.7)	B (15.5)	B (15.5)
Dixon Landing Rd./I-880 NB Ramps/California Circle	C+ (20.6)	C+ (20.9)	C (24.1)	C (24.1)

Note:
Average vehicle control delay in seconds shown in parenthesis.

Year 2000 Highway Capacity Manual Analysis Methodology; TRAFFIX software program with VTA adjustments.
Source: Crane Transportation Group

Under the three scenarios, all analysis intersections would operate at acceptable levels of service (A, B or C) during the AM and PM peak traffic hours, regardless of the interchange utilized by trucks to access SR 237. Project truck traffic during the AM peak hour would increase intersection control delay by no more than 0.3 second at any major intersection utilized. During the PM peak hour, project truck traffic would increase intersection control delay by no more than 0.1 second at any major intersection utilized. Because intersection LOS would not degrade to LOS E or F, this would be a **less than significant** impact for Alternatives 1 through 5.

Table 3.13-6 below shows the freeway segment LOS for 2010 and 2010 with the Project for each of the three scenarios.

Table 3.13-6 Freeway Segment Traffic Volume and Level of Service for Three Traffic Scenarios – 2010 and 2010 with the Project

Location	2010				2010 + Project (Scenario 1 – Great America Pkwy Freeway Access)				2010 + Project (Scenario 2 – 1st St. Freeway Access)				2010 + Project (Scenario 3 – Zanker Rd. Freeway Access)			
	AM	LOS	PM	LOS	AM	LOS	PM	LOS	AM	LOS	PM	LOS	AM	LOS	PM	LOS
I-880 Between SR 237 & Dixon Landing Rd.																
Northbound	36	D	114	F	37	D	114	**F**	37	D	114	**F**	37	D	114	**F**
Southbound	46	D	24	C	46	D	25	C	46	D	25	C	46	D	25	C
SR 237 – I-880 to Zanker Rd.																
Eastbound	27	D	43	D	29	D	44	D	29	D	44	D	29	D	44	D
Westbound	150	F	96	**F**	151	**F**	98	**F**	151	**F**	98	**F**	151	**F**	98	**F**
SR 237 – Zanker Rd. to N. 1st St.																
Eastbound	45	D	71	F	47	E	72	**F**	47	E	72	**F**	45	NA	71	NA
Westbound	65	F	55	E	66	**F**	57	E	66	**F**	57	E	65	NA	55	NA
SR 237 – N. 1st St. to Great America Pkwy.																
Eastbound	48	E	96	F	50	E	97	**F**	48	NA	96	NA	48	NA	96	NA
Westbound	44	D	39	D	45	D	41	D	44	NA	39	NA	44	NA	39	NA

Source: Santa Clara VTA 2006 Monitoring and Conformance Report/Crane Transportation Group

NA = Not applicable; no project truck traffic on these segments.

Bold = Project traffic would be added to roadway segments with unacceptable levels of operation (LOS F) and thus is considered significant based on Caltrans criteria.

As shown in Table 3.13-6 above, project traffic would not degrade AM or PM peak hour LOS A to E operation on the SR 237 or I-880 freeways to LOS F operation under Scenario 1. For those freeway segments experiencing unacceptable LOS F operation in 2010, project traffic volumes would increase by less than one percent and would be less than one percent of freeway segment capacity. Although this would be a less than significant impact per VTA standards, Caltrans considers any truck traffic added to freeway segments with LOS F operation as a significant impact. During the AM peak hour, Alternatives 1 through 5 would contribute traffic volume to two freeway segments (SR 237 – I-880 to Zanker Road and S.R. 237 – Zanker Rd., to N. 1st St., both westbound) with existing LOS F. During the PM peak hour, Alternatives 1 through 5 would contribute traffic volume to four freeway segments (northbound I-880 between S.R. 237 & Dixon Landing Rd., westbound S.R. 237 – I-880 to Zanker Road, eastbound S.R. 237 – Zanker Rd., to N. 1st St., and eastbound S.R. 237 – N. 1st St. to Great America Parkway) with existing LOS F. This truck traffic would be a significant impact to freeway segments. However, this impact is considered **Less Than Significant with Mitigation** after implementation of Mitigation Measure **TRANS-A**.

Project truck traffic impacts to freeway segments would be the same for Scenario 2 as Scenario 1, with the exception that three freeway segments would receive significant impacts during the PM peak hour according to Caltrans criteria. This impact under Scenario 2 is considered **Less Than Significant with Mitigation** after implementation of Mitigation Measure **TRANS-A**.

Project truck traffic impacts to freeway segments would be the same for Scenario 3 as Scenario 1, with the exception that one freeway segments would receive significant impacts during the AM peak hour; and two freeway segments would receive significant impacts during the PM peak hour. This impact under Scenario 3 is considered **Less Than Significant with Mitigation** after implementation of Mitigation Measure **TRANS-A**.

- **Mitigation Measure TRANS-A: Timing of construction related truck trips.**
  All Project haul truck traffic shall be limited to between the hours of 9:00 a.m. and ~~4:30 p.m~~ 3:30 p.m. In addition, the Project shall conform to the City's Traffic Control policies, and the Project applicant shall obtain a Haul Route Permit and, if needed, an Encroachment Permit.

Alternative 6: No Project

Under the No Project Alternative, traffic levels in the vicinity would remain at their current levels, given that no Project related dredging activities or haul truck trips would occur. **No Impact** would occur.

Impact TRANS-2: Addition of haul truck traffic on sections of the San Francisco Bay Trail

Summary – Common to All Alternatives

Portions of the Bay Trail (existing and proposed) would be traversed by the proposed haul route. Specifically, Taylor Street is a Spine Trail of the San Francisco Bay Trail (see Figure 3.11-1). Gold Street, Grand Avenue, and Los Esteros Road are proposed for inclusion in the San Francisco Bay Trail.

Alternatives 1, 2, 3, 4, and 5

Use of these streets as the haul route would not preclude their use by recreation users, and therefore this would be considered **Less than Significant**, and no mitigation is necessary. However, as a courtesy to the administrators and users of the Bay Trail, the ~~following~~ measures ~~would be adhered to:~~ identified in the Recreation section 3.11.3 **Mitigation Measure REC-A** require notification of trail closures.

- ~~**Mitigation Measure TRANS-B: Courtesy updates on construction activities.** Prior to initiating any significant hauling operations using existing or proposed Bay Trail segments, the District shall inform the Bay Trail Program Mangers; the City of San Jose Department of Parks, Recreation, and Neighborhood Services; and, the Santa Clara County Department of Parks and Recreation.~~

Alternative 6: No Project

Under the No Project Alternative, no Project related haul truck trips would occur. Therefore, **No Impact** would occur.

***Impact TRANS-3:* Increase in wear and tear on the designated haul routes during construction.**

Summary – Common to All Alternatives

The use of large trucks to transport equipment and material to and from the work sites may affect road conditions on the designated haul routes by increasing the rate of road wear. The degree to which this impact would occur depends on the design (pavement type and thickness) and the existing condition of the road. Oversized or excessive load vehicles traveling on State roadways, such as US 101, State Route (SR) 237 or I-880 would require a Transportation permit from Caltrans. Major arterials and collectors are designed to accommodate a mix of vehicle types, including heavy trucks. The Project's impacts are expected to be negligible on those roads. However, residential streets are not designed with a pavement thickness that will withstand substantial truck traffic volumes. If a substantial amount of truck traffic were to occur repeatedly through residential streets, then the Project would contribute to the wear and tear of these roadways.

Alternatives 1, 2, 3, 4, and 5

The haul route for truck trips originating at staging areas 1 through 5 would require trucks to travel along residential streets during the initial portion of the route. As described above, this truck traffic could contribute to accelerated wear and tear to these residential roadways. Some haul traffic may occur within a State Route right-of-way and would require a Transportation permit from Caltrans. This would be considered a **Less than Significant with Mitigation** after implementation of the following measure.

- **Mitigation Measure TRANS-C: Videotaping of Road Conditions/Road Repair Responsibility.**

  As local or residential streets are part of the designated haul route for the Alviso Slough Restoration Project, the District shall prepare a videotape of road conditions prior to the start-up of Project related activities for the residential streets affected by the Project. The District shall prepare a similar videotape of road conditions after vegetation/root mass removal and dredging of sediments and hauling of these materials to nearby landfill facilities are completed. The pre- and post-construction conditions of haul routes shall be reviewed by staff of the City of San Jose Public Works Department and permits from Caltrans shall be obtained. An agreement shall be entered into prior to Project related activities that will detail the pre-Project conditions and post-Project requirements of a roadway rehabilitation program.

Alternative 6: No Project

Under the No Project Alternative, residential street wear and tear would not be accelerated over current rates, given that no project related haul truck trips would occur.

Impact TRANS-4: **Roadway safety hazards associated with haul truck traffic exiting/entering staging areas.**

Summary – Common to All Alternatives

Trucks entering and exiting staging areas during vegetation and sediment materials hauling process could increase safety risks to other users of these roads, including pedestrians crossing streets, bicyclists and other motor vehicles.

Alternatives 1, 2, 3, 4, and 5

Haul trucks entering and exiting staging areas would travel along residential streets during the initial portion of the route. Truck traffic could contribute to safety hazards to other users of these roads. This would be considered a **Less than Significant with Mitigation** after implementation of the following measure.

- **Mitigation Measure TRANS-D: Use of safety signage and flagpersons at key locations.**
  The District or its designated construction contractor shall employ the use of safety related signage and flagpersons at key locations near staging area entrances and exits, in order to ensure safe passage through these areas by all users.

Alternative 6: No Project

Under the No Project Alternative, roadway safety hazards would not be introduced because no Project related haul truck trips would occur. Therefore, **No Impact** would occur.

3.13.4 Relationship to South Bay Salt Ponds Phase 1 Action at Pond A8

The impacts identified above would be the same with or without the Phase 1 Action at Pond A8. However, with successful implementation of the Phase 1 Action at Pond A8, maintenance intervals for this Project may be reduced, thereby reducing the number of truck trips transporting vegetation/root mass and sediments and the amount of disposal at the Zanker Road and Newby Island landfills.

3.13.5 Sediment Disposal Options

Sediment disposal options include barging or trucking the dredged sediment to a location where it could be re-used or otherwise disposed, rather than trucking the material to the Newby Island Landfill, as described in Chapter 2. These disposal options would result in similar transportation and traffic impacts as considered above and would require the same or similar mitigation measures.

Another option is the use of a slurry pipeline to convey dredged sediment from the Project area to a nearby restoration site such as Pond A8 or Pond A4 (if these are determined to be acceptable). The use of a slurry pipeline would greatly reduce the number truck trips required by the project. Mitigation similar to that proposed above would be required.

3.14 PUBLIC SERVICES (PUBSER)

This section presents information on public services in the Alviso Slough Restoration Project area. Public services include police, fire and emergency service, schools, and solid waste services. Background information was drawn from applicable regional and local general plans and policies as well as from public service agency representatives.

3.14.1 Regulatory Setting

This section provides the regulatory background necessary to analyze effects on public services associated with the Alviso Slough Restoration Project. Applicable local and regional plans and policies were reviewed for information on existing land uses and policies.

Table 3.14-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
FEDERAL	
None	
STATE	
None	
LOCAL	
Santa Clara County *County of Santa Clara General Plan*	The County of Santa Clara General Plan (County of Santa Clara, 1994) provides public services-related strategies and policies associated primarily with new (urban) development. Strategy #4 of the General Plan identifies the need to improve quality of life for all segments of the population. Policy C-EC 8(g) recognizes the need for providing adequate and efficient public services.
City of San Jose *City of San Jose 2020 General Plan*	The City of San Jose 2020 General Plan (City of San Jose, 2004) provides the following goals and policies related to city-wide public services. **Services and Facilities** **Goal** Provide a full range of City services to the community at service levels consistent with a safe, convenient, sustainable and pleasant place to live, work, learn and play. **Level of Service Policies** 1. The City's urban service delivery priorities should be ordered as follows: ▪ Provide services and facilities designed to serve existing needs. ▪ Prevent the deterioration of existing levels of service. ▪ Upgrade City service levels, when feasible. **Other Service Policies** 16. Utilize the following Citywide level of service measures as benchmarks to be used to evaluate major General Plan land use and policy changes, such as expansions of the Urban Service Area or land use changes from non-residential to residential: ▪ For police protection, achieve a response time of six minutes or

Table 3.14-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
	less for 60 percent of all Priority 1 calls, achieve a response time of eleven minutes or less for 60 percent of all Priority 2 calls. ▪ For fire protection, adhere to a four-minute average response time to all calls. ▪ For parks and recreation: 3.5 acres of neighborhood and community serving recreational lands per 1,000 population, of which a minimum is 1.5 acres of neighborhood, community or locally serving regional/City-wide park lands and up to two acres of school playgrounds, and all of which is located within a reasonable walking distance of the project; 7.5 acres of regional/Citywide park lands per 1,000 population; and 500 square feet of community center floor area per 1,000 population. ▪ For libraries, 2.75 volumes (items) held in the San Jose Public Library system per capita, and .59 square feet of library space per capita. The City recognizes that these performance measures are limited reflections of all City services and may change over time to reflect increasing diversity, new methods of service delivery or to reflect changing needs and priorities that are determined in the budgetary process. The details of these performance measures may also be addressed in the new or existing service planning documents of the relevant City departments that provide these services.

3.14.2 Physical Setting

In the South Bay, public services such as police, fire and emergency service are, for the most part, provided by each local jurisdiction. Emergency response staffing and ratios are discussed below, but are included for informative purposes only, and should not be used to determine adequacy of service. In most jurisdictions, adequacy of service is determined by response time, with an ideal response time set at around four minutes, and jurisdictions strive to maintain appropriate staff levels to achieve this goal.

Regional

Police Services

The Santa Clara County Sheriff's Department is headquartered at 55 West Younger Avenue in San Jose with a substation located at 14374 Saratoga Avenue in Saratoga. The Sheriff's Department provides police services to the unincorporated areas of Santa Clara County and includes the SBSP Restoration Project area. The Sheriff's Department has 635 full-time, sworn, badge staff. In addition to the full-time badge staff, the Sheriff's Office has 65 Reserve Deputy Sheriffs. To support the entire operation, the Department employs 223 non-sworn, civilian staff. The Sheriff's Department does not maintain a service standard based on officers per residents, but rather on the number of calls for service (Santa Clara County, 2004) (Rode, 2004).

There are several specialized units and teams within the Sheriff's Office. These include Community Relations, Canine Unit, Search and Rescue (including Mounted), Dive Team, Traffic/Motorcycles, Off-Road Enforcement Team, Hostage Negotiation Team, SERT (Sheriff's Emergency Response Team), Crowd Control Unit, Intelligence/Vice and Bomb Squad. The Sheriff's Office hosts or participates in several joint-agency task forces (Santa Clara County, 2004).

There is currently no known policing agreement for the Alviso Slough watercourse. ~~Therefore, it is unclear what agency has law enforcement responsibilities for the Slough.~~ However, the land area (Alviso) project site is within the City of San Jose (see discussion below).

Schools

Santa Clara County does not have its own school district but consists of school districts that are located within incorporated cities (e.g., San Jose). Please refer to the schools discussion in the Project area.

Parks

The Santa Clara County Department of Parks and Recreation manages 28 regional parks encompassing nearly 45,000 acres of land (SCC 2006). The Alviso Marina County Park is located just south of Pond A12 and east of Pond A8, and immediately north of the Project restoration area. This park is approximately 18.9-acres and provides opportunities for picnicking and birdwatching, as well as access to other public lands for seasonal hiking and mountain bicycling (SCC 2006).

Project Area

The Alviso Slough Restoration Project is located in the City of San Jose.

Police Services

The San Jose Police Department provides police protection services for the City of San Jose, including the Alviso Slough Restoration Project area. The Project area falls within the Department's Central policing division (SFPD 2006). The Department is headquartered at 201 West Mission Street in the City of San Jose with three Community Policing Centers located throughout the City. One Community Policing Center is located in Alviso at 1060 Taylor Street, which is within 0.5 mile of the Project site. The Police Department's emergency response time is six minutes or less. The police force consists of 1,379 sworn officers serving a population of 920,000 with a service ratio of 1.5 officers for every 1,000 residents (Depner, 2004).

Fire Protection and Emergency Services

The San Jose Fire Department (SJFD) provides fire protection services to the City of San Jose, including the Alviso Slough Restoration Project area. The SJFD serves a population of 923,000 and an area of 205 square miles. The SJFD maintains 31 fire stations (Station Numbers 1 through 31) located throughout the City. Station 25, located at 1590 Gold Street serves the Alviso area and would respond to any calls for service. This station is currently equipped with one engine (Post, 2004).

The SJFD has 794 employees (665 sworn staff) and includes paramedics, captains, chiefs, engineers. The SJFD maintains a current service ratio of approximately 0.7 firefighting staff per 1,000 residents (Post, 2004).

Schools

The San Jose Unified School District (SJUSD) provides public school education in the City for levels Kindergarten to 12th grade. The SJUSD has 27 elementary schools, six middle schools, and seven high schools, and one college preparatory charter school. No schools are located within the Alviso Slough Restoration Project area. One school (George Mayne Elementary School) is located in the community of Alviso, located more than 0.5 mile east of Pond A8.

Parks

The City of San Jose Department of Parks, Recreation and Neighborhood Services manages the City's park system and park amenities, trails, City golf courses, skate parks, dog parks, and community gardens (PRNS 2007). Alviso Park is located at Wilson Way and School, on N. 1st Street in the community of Alviso. This is a 7.5-acre park with restrooms, 15 picnic tables, 5 BBQs, 2 playgrounds, a lighted softball field, and a swimming pool (PRNS 2007). This park is located within one mile of the Proposed Project area.

The Don Edwards San Francisco Bay National Wildlife Refuge is located adjacent to Alviso Slough. The Refuge is dedicated to preserving and enhancing wildlife habitat, protecting migratory birds, protecting threatened and endangered species, and providing opportunities for wildlife-oriented recreation and nature study for the surrounding communities. As of 2004, the Refuge spans 30,000 acres of open bay, salt pond, salt marsh, mudflat, upland and vernal pool habitats located throughout south San Francisco Bay. Located along the Pacific Flyway, the Refuge hosts over 280 species of birds each year. Millions of shorebirds and waterfowl stop to refuel at the Refuge during the spring and fall migration.

3.14.3 Environmental Impacts and Mitigation

Overview

This section describes environmental impacts on land use, including the criteria used to determine the significance of impacts.

Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, a significant impact on public services would occur if the Project would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered government facilities, the construction of which could cause reduction in acceptable service ratios, response times, or other performance objectives for the following public services: parks, fire and police protection, and schools.

Impacts & Mitigation

The impacts analysis in this ~~Draft~~ Final EIR evaluates five action alternatives and the required No Project alternative. The action alternatives include vegetation removal and/or dredging, as described in Chapter 2. Under the No Project alternative, the District would not take any action in the Project area and existing programs would continue. The analysis covers impacts from the construction and maintenance phases–both in the slough and at staging areas.

All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by BCDC, CSLC, the District, or SBYC by the time of commencement of construction of this Project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Table 3.14-2 lists each impact identified for the proposed alternatives, along with the significance of each impact. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (less than significant and does not require mitigation), or Class IV (beneficial). Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections.

Table 3.14-2 Impact and Mitigation Summary

Impact	Impact Significance	Mitigation Measures
Impact SERV-1: Increased demand for fire and police protection services.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	
Note: The impacts and mitigation would be the same both with and without the SBSP Restoration Project.		

The Alviso Slough Restoration Project does not propose and would not require the construction of new parks, fire and police protection facilities, or schools. Therefore, no impacts to these public services would occur. The Project involves restoring the slough's channel width and does not include the construction of any residential, commercial, or industrial uses. Therefore, the Project would not result in an increase to the area's population. The Project would not induce growth nor affect the residential population of the area such that additional school, parks, fire, and police facilities would be needed.

Impact SERV-1: **Increased demand for fire and police protection services.**

Summary – Common to all Alternatives

Alternatives 1 through 6 would not result in or require new or altered government facilities to provide additional public services. Construction of new homes or businesses that would require increased need for public services would not occur. Construction workers are expected to come from the existing labor pool in the City, County, or nearby areas and would commute to the site for the duration of the Project. Therefore no workers are expected to relocate to the area for implementation of the Project as the construction timeframe would be short-term.

Alternatives 1, 2, 3, 4, and 5

The site is located within the existing service area and jurisdiction of both the SJPD and SJFD. Increased need for police and fire protection services to such an extent that it would cause reduction in acceptable response time or outpace natural growth in the region and require construction of new police and fire protection stations would not occur. This impact is considered **Less than Significant**.

Alternative 6: No Project

Alternative 6 would not result in vegetation and root mass removal or dredging in the Project area, and therefore could not result in increased demand for fire and police protection services. This is considered **No Impact**.

3.14.4 Relationship to South Bay Salt Ponds Phase 1 Action at Pond A8

The impacts identified above would be the same with or without the Phase 1 Action at Pond A8.

3.14.5 Sediment Disposal Options

Sediment disposal options include trucking or barging or conveying (e.g., by slurry pipeline) the dredged sediment to a location where it could be re-used, rather than trucking the material to the Newby Island Landfill, as described in Chapter 2. These disposal options would result in similar impacts as considered above.

3.15 UTILITIES (UTIL)

This section presents information on utility services and facilities located within the Project area. Utilities include gas, electricity, water, and wastewater. Background information was drawn from applicable regional and local general plans and policies as well as from utility representatives.

3.15.1 Regulatory Setting

This section provides the environmental and regulatory background necessary to analyze effects on public services associated with the proposed Project. Applicable local and regional plans and policies were reviewed for information on existing land uses and policies.

Table 3.15-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
FEDERAL	
None	
STATE	
California Public Utilities Commission *General Order 95*	Includes rules governing line clearance for overhead electrical transmission lines. It states the following: Rule 11. Water areas not suitable for sailboating must have a line clearance of at least 25 ft (8 m) above high water. Rule 12. Water areas suitable for sailboating, with a surface area over 2,000 acres, must have a line clearance of at least 47 ft (14 m) above high water. General Order 95 states that Rule 11 can be applied to areas where sailboating is prohibited and where other boating activities are allowed (California Public Utilities Commission 2006).
LOCAL	
City of San Jose *City of San Jose 2020 General Plan*	The City of San Jose 2020 General Plan (City of San Jose 2004a) does not provide relevant public services goals or policies associated with the Alviso Slough.

3.15.2 Physical Setting

Regional

In the South Bay area, gas and electricity service is provided to all cities by Pacific Gas & Electric (PG&E), except for the cities of Palo Alto and Santa Clara. PG&E owns and maintains a network of overhead transmission lines, power distribution lines and sub-stations. Gas and electricity are provided by the cities of Palo Alto and Santa Clara to their respective residents primarily through PG&E's network of transmission lines.

Water and wastewater utilities are provided on both citywide and regional levels, with facilities and infrastructure supporting these services maintained by the service providers. Water and wastewater infrastructure includes water and wastewater pipelines, wastewater treatment plants and discharge facilities, and storm drainage facilities. Water and wastewater pipelines are generally located within city streets. In the lower reaches of the watersheds, runoff from developed areas is carried through pipes and discharged to tidal sloughs or channels by gravity-driven flow or lift stations. Storm water discharged by lift stations is relatively unaffected by slight variations in tide. An extensive inventory of storm water facilities is provided in a report prepared for the South Bay Salt Ponds area, which includes the Proposed Project area (Moffatt & Nichol Engineers 2005). Presently, not all storm outfalls to the restoration area have been located in the field, and data such as pipe invert information and system capacity have not been determined.

Project Area

Gas and Electricity

No overhead transmission lines pass over the Alviso Slough Restoration Project area, nor are any PG&E towers located in the Project area. However, PG&E overhead transmission lines traverse through the Alviso pond complex (Ponds A5, A6, A7 and A8) of the SBSP Restoration Project area in several locations adjacent to the Alviso Slough Restoration Project area. A distribution line extends northward from the main transmission line near Pond A8S along the internal levee between Ponds A8, A5 and A7. This distribution line provides electricity to a pump at Pond A8, which is used by the USFWS to convey water between Ponds A8 and A7. However, implementation of the Phase 1 Action for the SBSP Restoration Project would include demolition and removal of the existing overhead power distribution lines prior to restoration activities.

PG&E has seven restringing access points located on levees or immediately adjacent to ponds within the Alviso pond complex. However, none of the restringing access points are located within the Alviso Slough Restoration Project area.

Water and Wastewater

No water or wastewater pipelines run through the Alviso Slough Restoration Project area or the Alviso pond complex. Several storm water lift stations are located just outside the Alviso pond complex but discharge to tidal sloughs and channels in the SBSP Restoration Project area.

Two South Bay wastewater treatment plants are located near the Alviso Slough Restoration Project area and discharge to sloughs within the Alviso pond complex. The San Jose/Santa Clara Water Pollution Control Plant (WPCP) is located between Artesian Slough and Coyote Creek just outside of the Alviso pond complex. It is operated by the City of San Jose Environmental Services Division and provides treatment services to the cities of San Jose, Santa Clara, Milpitas, Campbell, Cupertino, Los Gatos, Saratoga, and Monte Sereno. Treated effluent from the WPCP is discharged to Artesian Slough, which is east of the Project area. Average daily discharge flow is approximately 110 MGD (RWQCB 2005). Discharge from the San Jose/Santa Clara WPCP outfall flows into the outfall channel located at the upstream end of Artesian Slough. At the downstream end of the outfall channel, discharge flows over a weir and into Artesian Slough. The Sunnyvale WPCP is located just south of the Alviso pond complex and discharges approximately 14 to 15 MGD into Moffett Channel which connects to Guadalupe Slough (PWA and others 2005).

In the Alviso pond complex, storm drain outfalls are known to exist on Coyote Creek, Guadalupe River / Alviso Slough, Sunnyvale East and West Channels, Moffett Channel, Calabazas Creek, Permanente

Creek, Stevens Creek, and Penitencia Creek (Moffatt & Nichol Engineers 2005). Numerous outfalls are located at various inverts along these channels.

Solid Waste

Norcal Waste Systems collects and disposes/recycles the majority of the residential and commercial waste from within the City (City of San Jose, 2005), while GreenTeam provides solid waste and recycling service to a portion of the City. The Zanker Road Class III Landfill is located approximately two miles from the Project site. This landfill's operational activities include a solid waste landfill, large volume transfer/processing facility, composting facility (green waste), minor waste tire facility, and materials recovery facility (CIWMB 2007). The total permitted capacity of this landfill is 1,300,000 cubic yards, and it currently has a remaining capacity of approximately 700,000 cubic yards with a permitted maximum disposal of 1,300 tons per day (CIWMB 2007a).

The Newby Island Sanitary Landfill is one of the largest active dumps on the shores of the bay. Located in Milpitas, approximately seven miles from the Alviso Slough Project site, it is the terminus for waste for all of San Jose, Milpitas and other cities. The 342 acre pile is still at least 30 feet from its permitted height of 120 feet, and has 18,274,953 (c.y.) of remaining capacity. It has a permitted maximum disposal of 4,000 tons per day (CIWMB 2007b).

3.15.3 Environmental Impacts and Mitigation

Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, a significant impact on utilities and service systems would occur if the Project would:

- Substantially reduce the ability to access PG&E towers, stations, or electrical transmission lines;
- Reduce the structural integrity of the marine foundations that support PG&E towers;
- Reduce clearance between waterways and electrical transmission lines such that navigation of watercraft was substantially affected;
- Change water level, tidal flow or sedimentation such that drainage of storm drains, operation of pumping facilities, or discharge of sewer force mains were substantially affected;
- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- Require or result in the construction of new water or wastewater treatment or storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Not have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements are needed;
- Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Be served by a landfill without sufficient permitted capacity to accommodate the project's solid waste disposal needs; or
- Not comply with federal, state, and local statues and regulations related to solid waste.

Impacts & Mitigation

The impacts analysis in this ~~Draft~~ Final EIR evaluates five action alternatives and the required No Project alternative. The action alternatives include vegetation removal and/or dredging, as described in Chapter 2. Under the No Project alternative, the District would not take any action in the Project area and existing programs would continue. The analysis covers impacts from the construction and maintenance phases–both in the slough and at staging areas.

All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by BCDC, CSLC, the District, or SBYC by the time of commencement of construction of this Project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Table 3.15-2 lists each impact identified for the proposed alternatives, along with the significance of each impact. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (less than significant and does not require mitigation), or Class IV (beneficial). Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections.

Table 3.15-2 Impact and Mitigation Summary

Impact	Impact Significance	Mitigation Measures
Impact UTIL-1: Changes in water level, tidal flow and sedimentation near pumping facilities or outfalls.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact UTIL-2: Short-term increase in solid waste disposal from removal of vegetation, sediment, and navigational hazards.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Note: The impacts and mitigation would be the same both with and without the SBSP Restoration Project.		

As described in the Project area setting, there are no overhead transmission lines or towers in the Alviso Slough Restoration Project area, and water and wastewater pipelines do not run through the area. Therefore, the Proposed Project and Alternatives would not impede access to these facilities, adversely affect navigation, or reduce the structural integrity of the foundations that support the PG&E towers.

The proposed restoration of the Alviso Slough area would not generate any wastewater and therefore would not exceed wastewater treatment requirements of the Regional Water Quality Control Board; would not require the construction of new water or wastewater treatment facilities or expansion of existing facilities; would not require or result in the construction of new storm water drainage facilities or expansion of existing facilities; and would not result in new or expanded water entitlements. No impacts are associated with these significance criteria, and therefore these issues are not discussed any further.

Impact UTIL-1: Changes in water level, tidal flow and sedimentation near pumping facilities or outfalls.

Summary – Common to All Alternatives

The urban areas adjacent to the Alviso Slough Restoration Project area contain several storm water lift stations that would discharge to sloughs upstream (Moffatt & Nichol Engineers 2005). Two storm water lift stations are located in the community of Alviso which discharge to Alviso Slough and lower Guadalupe River (Moffatt & Nichol Engineers 2005). During storm events, storm water runoff from the surrounding developed areas flows through storm drain systems towards the Bay. In areas where discharge to the tidal sloughs via gravity flow is not possible, the storm water is pumped, or 'lifted,' and discharged into the adjacent sloughs.

Changes to water levels or sedimentation patterns generally do not substantially affect pumping facilities, unless water surface elevations during high tide are substantially raised or sediment accumulation at discharge locations block outfall structures.

Alternatives 1, 2, 3, 4, and 5

The San Jose/Santa Clara WPCP and the City of Sunnyvale WPCP discharge to sloughs which drain portions of the Alviso pond complex. The San Jose/Santa Clara WPCP discharges to Artesian Slough upstream of the Project boundary and the City of Sunnyvale WPCP discharges to Moffett Channel, which drains to Guadalupe Slough adjacent to Pond A5 (located immediately west of Pond A8). Although discharges from these facilities occur outside the Alviso Slough Restoration Project area, they are close enough that regional-level hydrodynamic changes may affect the operation of the outfalls. Because there are no sewer force mains located in the vicinity or within the Project area boundaries, and the Project would not result in changes to water levels, tidal flow, and sedimentation near these pumping facilities, **No impacts** to these facilities would occur.

Alternative 6: No Project

Under the No Project Alternative, the Project area would continue to be managed in its current state. No vegetation or sediment removal and disposal would occur. **No impact** to water level, tidal flow and sedimentation near pumping facilities or outfalls would occur.

Impact UTIL-2: Short-term increase in solid waste disposal from removal of vegetation, sediment, and navigational hazards

Summary – Common to all Alternatives

Alternatives 1 through 5 would include the removal of vegetation and root mass and sediment (Alternatives 3, 4, and 5 only), as well as removal of abandoned vessels and navigational hazards. Land-based staging areas for the harvested plant material and sediment would be needed for temporary storage and de-watering purposes. Over the course of many months, the vegetation and root mass materials would hauled to the Zanker Road Landfill for composting (vegetation only), or to the Newby Island landfill for disposal (dry sediment only).

Alternatives 1, 2, 3, 4, and 5

Under all Alternatives, the harvested plant material would be composted and re-used and thus would not impact the remaining storage capacity at the Zanker Road landfill. However, Alternatives 3, 4, and 5 would result in the production of a significant amount of dredged material for disposal at the Newby Island Landfill. Disposal of the abandoned vessels would contribute a small fraction of the remaining landfill capacity and would not exceed the daily maximum intake limits of the landfill facility, and the construction contractor would be required to comply with all laws and regulations related to solid waste.

Furthermore, there are approximately seven abandoned vessels in the Project area that would be removed and either salvaged, sold, or disposed of at the Zanker Road Landfill, which has a complete demolition recycling facility that can accept and process unsorted demolition debris materials at the rate of 135 tons per hour (Zanker 2007). Disposal of the abandoned vessels would contribute a small fraction of the remaining landfill capacity and would not exceed the daily maximum of the landfill facility.

There would be no long-term impacts to solid waste as this project would not involve residential, commercial, or industrial development that would generate solid waste needs. The proposed project would not result in the landfill exceeding its permitting capacity, and therefore this impact is considered **Less than Significant**.

Alternative 6: No Project

Under the No Project Alternative, the Project area would continue to be managed in its current state. No vegetation or sediment removal and disposal would occur. **No impact** to solid waste facilities would occur.

3.15.4 Relationship to South Bay Salt Ponds Phase 1 Action at Pond A8

The impacts identified above would be the same with or without the Phase 1 Action at Pond A8. However, with successful implementation of the Phase 1 Action at Pond A8, maintenance intervals for this Project may be reduced, thereby reducing the amount of disposal at the Zanker Road and Newby Island landfills.

3.15.5 Sediment Disposal Options

Sediment disposal options include trucking, barging, or conveying (e.g., by slurry pipe) the dredged sediment to a location where it could be re-used or disposed of, rather than trucking the material to the Newby Island Landfill, as described in Chapter 2. These disposal options would result in similar impacts as considered above.

3.16 AESTHETICS (AES)

This section addresses potential impacts from the Project to the aesthetic environment of the Project area, which includes the community of Alviso and the Alviso Slough. Existing regional and local aesthetic conditions are described, and applicable regulatory plans and policies are listed. Potential impacts from the Project are then determined based upon appropriate significance criteria. The information presented in this section is based on a review of existing documentation and information collected by environmental planners who have studied this area. Photo simulations are included at the end of this section (Figures 3.16-1 through 3.16-12).

3.16.1 Regulatory Setting

Two local agencies with regulatory interests in the Alviso Sough area have policies related to aesthetic resources: Santa Clara County and City of San Jose. Goals and policies of each of the agencies are summarized in the text below and listed in Table 3.16-1. The Santa Clara County General Plan (1994) identifies strategies and policies to preserve and enhance scenic resources within its boundaries. Three general strategies include: 1) Manage Growth and Plan for Open Space; 2) Minimize Development Impacts On Significant Scenic Resources; and 3) Maintain and Enhance the Values of Scenic Urban Settings.

The City of San Jose 2020 General Plan (2004) identifies the City's baylands as one of many scenic resources. Visual quality-related goals are generally relevant to new development. The City also recognizes that preservation of scenic routes as critical to preservation and enhancement of such resources. Designated trails and pathways are located near the Alviso Slough Restoration Project site. The Alviso Master Plan (1998), a specific plan for the Alviso community, does not include policies that directly relate to issues of aesthetics; however, a number of objectives and policies focus on the retention and enhancement of the existing community character.

Table 3.16-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
FEDERAL	
None	
STATE	
California Department of Transportation *The California Scenic Highway System*	There are no State Scenic Highways in the vicinity of the Project area.
LOCAL	
Santa Clara County *General Plan* *C-RC 57*	The scenic and aesthetic qualities of both the natural and built environments should be preserved and enhanced for their importance to the overall quality of life for Santa Clara County.

Agency + Plan or Policy	Overview & Applicability
Santa Clara County *General Plan* *C-RC 58*	The general approach to scenic resource preservation on a countywide basis should include the following strategies: a. conserving scenic natural resources through long range, inter-jurisdictional growth management and open space planning; b. minimize development impacts on highly significant scenic resources; and c. maintaining and enhancing scenic urban settings, such as parks and open space, civic places, and major public commons areas.
Santa Clara County *C-RC 59*	Scenic values of the natural resources of Santa Clara County should be maintained and enhanced through countywide growth management and open space planning.
City of San Jose *City of San Jose 2020 General Plan Aesthetic, Cultural and Recreational Resources, Trails and Pathways Policy 1*	"The City should control land development along designated Trails and Pathways Corridors in order to provide sufficient trail right-of-way and to ensure that new development adjacent to the corridors does not compromise safe trail access nor detract from the scenic and aesthetic qualities of the corridor."
City of San Jose *City of San Jose 2020 General Plan Land Use and Transportation Diagram Scenic Routes*	The integrated system of scenic routes illustrated on the Scenic Routes and Trails Diagram serve four major functions: pleasure travel; access (to scenic areas); environmental protection; and community image. The Project area includes the two following scenic routes: **Trails and Pathways Corridors.** Trails and Pathways Corridors are the interconnecting trail system in the City of San Jose, providing many important access links to the regional parks and open spaces in or adjoining the City. The Scenic Routes and Trails Diagram indicates these focal points and designates the most feasible and accessible routes to develop trails. The types of trails that can be located in a designated Trail and Pathway corridor are: hiking, walking and jogging trails; equestrian trails; and bicycle paths. **Rural Scenic Corridors.** Rural Scenic Corridors are generally located in rural and open space areas of significant scenic value. These Corridors can be defined as the scenic route right-of-way plus the landscape visible on either side of that right-of-way.

3.16.2 Physical Setting

Regional

The Project area is located in the southern extent of the San Francisco Bay. Major visual features in the region include the coastal ranges to the west, the Santa Cruz Mountains to the south, the San Francisco Bay, and the open salt ponds along the edge of the Bay. The San Mateo Bridge (SR 92) and the Dumbarton Bridge (SR 84) are also prominent visual features in the region. Visual characteristics in the South Bay range from urban to rural. In urban areas, visual resources include industrial, commercial and residential development and associated infrastructure (e.g., power lines, roads, flood control channels, etc.). In rural and open space areas, visual resources include salt ponds (both currently in and out of production), bayside mudflats, restored marshes, sloughs, and parks.

The salt ponds along the Bay provide visual contrast to the surrounding urban development due to their assortment of geometric shapes (created by raised levees) and colors (e.g., pink, green, yellow, rust, and white). Ground-level public streets and trails provide views of the pond system. Some of the ponds are also visible from major highways in the South Bay (e.g., SR 92 and SR 84) and all are highly visible to airline passengers in the approach patterns for San Francisco, Oakland, and San Jose airports. Because the terrain is relatively flat, the salt ponds are best viewed from elevated vantage points or from the air, so the entire pond landscape can be seen. From these vantage points, the constant changes in the visual quality of the ponds are especially noted; colors vary according to the time of day, the season of year, and the presence of cloud cover as well as to salinity levels. In addition to the ponds, the multitudinous creeks and sloughs that meander through the salt ponds and bayshore give depth to the otherwise flat, geometric panorama.

Project Area

The general Project area consists of the community of Alviso and the Alviso Slough, which are generally divided by the levee along the eastern edge of the slough.

Alviso is characterized by its isolation from the nearby large cities of San Jose, Sunnyvale, and Milpitas. The community of Alviso includes the historic western grid, the neighborhood grid, and the lands on both sides of North 1st Street from Liberty Street to the southern boundary of the George Mayne Elementary School. The community includes single-family residences, some duplexes, triplexes, and small apartment buildings, small grocery stores, restaurants, warehouses, and trucking operations. It also contains San Jose's only yacht club and associated harbor. The 154-year old town is listed as a Historic District in the NRHP.

Alviso is oriented towards the bay, both in form and function, as the built environment in the Project area consists of many older one- to two-story brick and wood buildings, a number of which served the purposes of the town's former existence as a port. The expansive, relatively flat open spaces in the salt ponds complex to the north and northeast dominate views from many points within the downtown area, and particularly views from the Alviso Marina County Park. Views of the Slough itself from the town are limited by the presence of the slough's levee and tall vegetation.

The Alviso Slough is characterized by a topographically flat and extensive visual environment with uninterrupted views of land, water, and sky. Pond A12 occupies the northwest corner of the Project area, and Pond A8 occupies the majority of the Project area's eastern edge (see Figure 1-2). A pile of concrete debris exists between Ponds A8 and A8S to the south, in the southwest section of the Project area. Besides the debris, there are no distinctive aesthetic features at this pond. Pond A8 is visible from the San Francisco Bay Trail alignment, which runs along Pond A12, across the slough.

Long-range views from areas around the Slough include the surrounding mountain ranges and SR 84 / Dumbarton Bridge. Medium-range views in and around the slough include the active landfill east of the pond complex, the Refuge's Environmental Education Center the San Francisco Bay, and urban uses to the south and west (Sunnyvale treatment ponds, parks, industrial uses, and the community of Alviso).

The Slough is generally hidden by low-lying vegetation as it passes through the Project area. As such, while distant hills and the adjacent salt ponds are visible in long and medium-range views, vegetation and land forms (namely the levee) dominate short-range views. Conversely, partial to full views of the Project area are available from distant hills (long range), from the salt ponds (medium-range) and from trails along the levee and Alviso Marina County Park (short-range). No scenic highways (as designated by the California Department of Transportation) overlook the slough. However, the Project area does include a scenic "Trails and Pathways Corridor," as well as a "Rural Scenic Corridor," as designated by the City of San Jose General Plan 2020. In addition, the trails along the levee include part of the San Francisco Bay Trail alignment, which runs adjacent to the Alviso Slough and Alviso Marina County Park en route to circumnavigating the Don Edwards San Francisco Bay National Wildlife Refuge.

3.16.3 Environmental Impacts and Mitigation

Overview

This section describes environmental impacts on visual resources, including the criteria used to determine the significance of impacts.

Significance Criteria

In accordance with Appendix G of the CEQA Guidelines, a significant impact on visual resources would occur if the Project would:

- Have a substantial, demonstrable negative aesthetic effect on a scenic vista;
- Substantially damage scenic resources including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Impacts and Mitigation

The impacts analysis in this ~~Draft~~ Final EIR evaluates five action alternatives and the required No Project alternative. The action alternatives include vegetation removal and/or dredging, as described in Chapter 2. Under the No Project alternative, the District would not take any action in the Project area and existing programs would continue. The analysis covers impacts from the construction and maintenance phases–both in the slough and at staging areas.

All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by BCDC, CSLC, the District, or SBYC by the time of commencement of construction of this Project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Table 3.16-2 lists each impact identified for the proposed alternatives, along with the significance of each impact. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (less than significant and does not require mitigation), or Class IV (beneficial). While a number of community residents believe the open water views created by any one of the project alternatives would have beneficial impacts, the EIR analyzes the visual impacts in a conservative context and finds that the impacts are less than significant and do not require mitigation. Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections.

Table 3.16-2 Impact and Mitigation Summary

Impact	Impact Significance	Mitigation Measures
Impact AES-1: Effects on scenic vistas.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Impact AES-2: Effects on the visual character of the Project area.	Alts. 1-5: Class III	--
	Alt. 6: No Impact	--
Note: The impacts and mitigation would be the same both with and without the SBSP Restoration Project.		

Because the Project proposes only to remove vegetation that has encroached upon the area within the Alviso Slough channel, no scenic resources would be substantially damaged. Further, because the Project does not propose the construction of any new structures, there would be no creation of a new source of substantial light or glare. The Project site is not located within a scenic highway and does not contain scenic resources including trees, rock outcroppings, and historic buildings. Therefore, the analysis of impacts to aesthetic resources shall be limited to the discussion of the potential of the Project to substantially affect scenic vistas or substantially degrade the existing visual character or quality of the site. Impacts are presented in terms of duration: short-term impacts refer to impacts occurring during construction phases; long-term impacts refer to permanent changes in the visual landscape resulting from implementation of the Project.

Impact AES-1: Effects on scenic vistas.

Scenic vistas refer to views of Alviso Slough as part of the larger picture of the South Bay scenery.

Alternative 1: Vegetation and Root Mass Removal (2.6 acres) to four-foot depth

Implementation of Alternative 1 would not result in a substantial, demonstrable negative aesthetic effect on a scenic vista. The vegetation proposed to be removed is part of the existing stand of vegetation, which is visible in long- and medium-range views of the Project area and which dominates short-range views from trails along the nearby levee and park. The resultant average width of the slough between Gold Street and County Marina would increase to 80 feet from the current average width of 50 feet. While more of the water's surface would be visible, and the loss of natural-appearing vegetation would be an apparent visual change, unharvested vegetation would remain the dominant visual feature in views. However, because of the relatively flat, expansive setting, the Project area is part of a larger landscape in scenic vistas from short-, medium- and long-range viewpoints. Views from distant hills, from locations within the SBSP Restoration Project Alviso pond complex, and from along nearby trails would not be substantially altered by the removal of 2.6 acres of vegetation from within the channel, because most views would also include wide-ranging views of the surrounding slough and salt ponds area.

No structures would be built as part of the Project, and no existing scenic vistas would be obstructed. The abandoned or beached boats within the Project area would not appear in views. Approximately 8,320 c.y. of vegetation and root mass would be generated. However, this removed vegetation would be stored at a staging area for de-watering and would only remain in such a location temporarily (approximately two to three days) before being loaded and hauled to an appropriate waste facility. Because the presence of machinery used for vegetation and root mass removal, as well as the removed vegetation itself, would be temporary, the short-term impact would not be considered to constitute a demonstrable, negative affect on a scenic vista. This impact is considered **Less than Significant**.

Alternative 2: Vegetation and Root Mass Removal (7.0 acres) to four-foot depth

For reasons similar to those described above for Alternative 1, implementation of Alternative 2 would not result in a substantial, demonstrable negative aesthetic effect on a scenic vista. The approximately seven acres of vegetation to be removed would be distributed along both sides of the slough throughout the majority of the Project area. The resultant average width of the slough between Gold Street and County Marina would increase to 130 feet from the current average width of 50 feet. The channel would appear to have been uniformly widened, thus exposing more water in views of the area and the reduction of natural vegetation would be an apparent change to the visual setting. However, the vegetation in the surrounding area would remain the dominant feature in views of the area, and scenic vistas including the Project area would also include the larger surrounding landscape, which would remain unchanged by the Project.

It is anticipated that some ongoing mechanical maintenance would be required to sustain the seven-acre footprint of vegetation and root mass removal (3 intervals over the initial 10-year Project timeline). Approximately 22,400 c.y. of vegetation and root mass would be generated. This removed vegetation would be stored at a staging area until the entire mass can be hauled to an appropriate waste facility. Because the presence of machinery used for vegetation and root mass removal, as well as the removed vegetation itself would be temporary, the short-term impact would not be considered to constitute a demonstrable, negative affect on a scenic vista. No new structures would obstruct any views, and abandoned vessels would be removed. This impact is considered **Less than Significant.**

Alternative 3: Vegetation / Root Mass Removal and Shallow Dredging (3.7 acres) to eight-foot depth

Implementation of Alternative 3 would not result in a substantial, demonstrable negative aesthetic effect on a scenic vista. The resultant average width of the slough between Gold Street and County Marina would increase to 100 feet from the current average width of 50 feet. As with other alternatives, the removal of natural vegetation would result in a change to the area's visual resources, but the presence of water would be increased in most views, and unharvested vegetation would remain dominant in long-, medium-, and short-range views of the Project area. The area proposed to be removed under this alternative includes approximately the same area described in Alternative 1, with an additional 1.1 acres downstream. Scenic vistas in which these specific areas are included would not be substantially altered.

It is anticipated that maintenance dredging would be required approximately every three years. Approximately 11,840 c.y. of vegetation and root mass would be generated, and approximately 60,000 c.y. of sediment (dry) would be generated from the dredging. The removed vegetation and sediment would be stored at a staging area for de-watering, which may be generated faster than it can be disposed of at an appropriate waste facility. Because the presence of machinery used for the vegetation/root mass removal and dredging, as well as the removed vegetation and sediment itself would be temporary, the short-term impact would not be considered to constitute a demonstrable, negative affect on a scenic vista. As with other alternatives, no new structures would obstruct any views, and abandoned vessels would be removed. This impact is considered **Less than Significant**.

Alternative 4: Vegetation/Root Mass Removal and Deep Dredging (6.2 acres) to 16-foot depth

Implementation of Alternative 4 would not result in a substantial, demonstrable negative aesthetic effect on a scenic vista. This alternative would result in the largest volume of vegetation / root mass removal and deep dredging among those considered. However, its impacts to aesthetic resources would be similar to the alternatives discussed above. The resultant average width of the slough between Gold Street and County Marina would increase to 110 feet from the current average width of 50 feet. The channel would appear to be uniformly widened on both sides, exposing more water in views of the area. Unlike Alternatives 1 through 3, the width of the channel upon implementation would allow for two-way boat traffic. While this reduction of natural vegetation would be a more substantial change to existing visual resources, unharvested vegetation in the surrounding area would remain the dominant feature in views of the area, and scenic vistas including the Project area would also include the larger surrounding landscape, which would remain unchanged by the Project.

The deep dredging would potentially sustain a wider channel for up to 10 years. Any machinery used for initial dredging and harvesting, as well as for possible maintenance in ten years time would be visible within the slough only temporarily and for a relatively short duration; it would not be considered to constitute a demonstrable, negative affect on a scenic vista. Approximately 19,840 c.y. of vegetation and root mass would be generated, and approximately 200,000 cubic yards of sediment (dry) would be generated. Alternative 4 would generate a significantly larger volume of sediment from the dredging compared to Alternatives 1 through 3. The removed vegetation and sediment would be stored at a staging area for de-watering, which would be generated faster than it can be disposed of at an appropriate waste facility. The removed vegetation and sediment would be stored at the staging areas at a height of two to six feet. The stored material could be visible from surrounding areas and would have a short-term visual impact. However, all of the material would be removed over many months and would not have a permanent impact to the scenic vista. Because the presence of machinery used for the vegetation/root mass removal and dredging, as well as the removed vegetation and sediment itself would be temporary, the short-term impact would not be considered to constitute a demonstrable, negative affect on a scenic vista. No new structures would obstruct any views, and abandoned vessels would be removed. This impact is considered **Less than Significant**.

Alternative 5: Vegetation/Root Mass Removal (15.3 acres) to a four-foot depth and Dredging (9.7 acres) to a 10-foot depth

Implementation of Alternative 5 would not result in a substantial, demonstrable negative aesthetic effect on a scenic vista. This alternative would result in the second largest volume of vegetation / root mass removal and deep dredging among those considered. However, its impacts to aesthetic resources would be similar to the alternatives discussed above. The resultant average width of the slough between Gold Street and County Marina would increase to 160 feet from the current average width of 50 feet. The channel would appear to be uniformly widened on both sides, exposing more water in views of the area. Unlike Alternatives 1 through 3, the width of the channel upon implementation would allow for two-way boat traffic. While this reduction of natural vegetation would be a more substantial change to existing visual resources, unharvested vegetation in the surrounding area would remain the dominant feature in views of the area, and scenic vistas including the Project area would also include the larger surrounding landscape, which would remain unchanged by the Project. The deep dredging would potentially sustain a wider channel for up to 10 years. Any machinery used for initial dredging and harvesting, as well as for possible maintenance in 10 years time would be visible within the slough only temporarily and for a relatively short duration; it would not be considered to constitute a demonstrable, negative affect on a scenic vista. Approximately 80,000 c.y. of vegetation and root mass would be generated, and approximately 200,000 cubic yards of sediment (dry) would be generated. Similar to Alternative 4, Alternative 5 would generate a significantly larger volume of sediment from the dredging compared to Alternatives 1 through 3. The removed vegetation and sediment would be stored at a staging area because it would be generated from the slough faster than it can be disposed of at an appropriate waste facility. The removed vegetation and sediment would be stored at the staging areas at a height of approximately two to six feet. The stored material could be visible from surrounding areas and would have a short-term visual impact. However, all of the material would be removed over many months and would not have a permanent impact to the scenic vista. Because the presence of machinery used for the vegetation/root mass removal and dredging, as well as the removed vegetation and sediment itself would be temporary, the short-term impact would not be considered to constitute a demonstrable, negative affect on a scenic vista. No new structures would obstruct any views, and abandoned vessels would be removed. This impact is considered **Less than Significant**.

Alternative 6: No Project

Under the No Project alternative, the District would take no action to restore navigation and recreation in the slough. Maintenance or other activities (such as regular maintenance of the flood protection levees, etc.) would continue under current management direction. No loss of wetland vegetation would occur under the No Project alternative. This alternative would not include removal of the abandoned vessels and navigational hazards within the Project area.

As there would be no actions taken as part of the Project, Alternative 6 would not result in a long-term, substantial, demonstrable negative aesthetic effect on a scenic vista. This is considered **No Impact.**

Impact AES-2: Effects on the visual character of the Project area.

Visual character refers to the more localized view of the slough and Project area as compared to scenic vistas. It reflects the experiences of residents and visitors who live, work, and recreate in and around Alviso Slough.

Alternatives 1, 2, and 3

The proposed actions described for Alternatives 1, 2, and 3 in the discussion of Impact AES-1 would not substantially degrade the existing visual character or quality of the site and its surroundings. The removal of 2.6, 7.0, or 3.7 acres of wetland vegetation and corresponding greater presence of open water or mudflats in the visual landscape would not detract from the natural character of the area. The color and rough texture of the wetland vegetation would remain the dominant feature in the visual landscape despite the greater presence of the relatively smooth waterway. Although highly subjective, some people may find the removal of vegetation and abandoned boats to be an improvement to the visual character of the area. No permanent structures would be placed within the landscape. Visual impacts from the presence of construction equipment would be temporary. As such, the long-term visual impact from Alternatives 1, 2, or 3 to the existing visual character of the site and its surroundings would be **Less than Significant**.

Alternatives 4 and 5

The proposed actions described for Alternatives 4 and 5 in the discussion of Impact AES-1 would not substantially degrade the existing visual character or quality of the site and its surroundings. As discussed in Impact AES-1, short-term impacts to the visual character of the area would occur as a result of the vegetation/root mass removal and dredging activities. The removal of 6.2 or 25 acres of wetland vegetation and corresponding greater presence of deeper water and mudflats in the visual landscape would not detract from the natural character of the area. Alternatives 4 and 5 would result in the largest visual transformation overall, because the deeper dredging action would create larger areas of deeper water. The color and rough texture of the surrounding wetland vegetation would remain the dominant feature in the visual landscape despite the greater presence of the relatively smooth waterway. Although highly subjective, some people may find the removal of vegetation and abandoned boats to be an improvement to the visual character of the area.

The potential presence of functioning watercraft in the wider channel would represent a change from existing conditions, as currently the waterway includes only abandoned vessels. However, given the wider, bayside context and the nearby location of the SBYC, this would not be considered a substantial degradation of the site's existing visual character. No permanent structures would be placed within the landscape; visual impacts from the presence of construction equipment would be temporary, and would not result in degradation of the existing visual quality of the site. As such, the impact from Alternatives 4 and 5 to the existing visual character of the site and its surroundings would be **Less than Significant.**

Alternative 6: No Project

As there would be no actions taken to widen or deepen Alviso Slough between Gold Street and the Alviso Marina County Park, Alternative 6 would not substantially change the existing visual character or quality of the site and its surroundings. This is considered **No Impact.**

3.16.4 Relationship to South Bay Salt Ponds Phase 1 Action at Pond A8

This section describes the impacts of the Project alternatives assuming the SBSP Phase 1 Action at Pond A8 is implemented.

Impact AES-1: **Effects on scenic vistas.**

Alternatives 1, 2, 3, 4, and 5

The Alviso Slough Restoration Project would result in the same impacts to aesthetics with or without implementation of the SBSP Phase 1 Action at Pond A8. However, the scour that would result from implementation of the Phase 1 Action may reduce the maintenance intervals for the Alviso Slough Restoration Project which would lessen the time required by maintenance activities. The impact to scenic vistas is considered **Less than Significant**.

Alternative 6: No Project

No loss of vegetation would occur under the No Project alternative. These changes would be partially self-sustaining by the Phase 1 Action and would not require the District to implement maintenance. **No impact** to scenic vistas would occur.

Impact AES-2: **Effects on the visual character of the Project area.**

Alternative 1, 2, 3, 4, and 5

The Alviso Slough Restoration Project would result in the same impacts to aesthetics with or without implementation of the SBSP Phase 1 Action at Pond A8. However, the scour that would result from implementation of the Phase 1 Action may reduce the maintenance intervals for the Alviso Slough Restoration Project which would lessen the time required for maintenance activities. The impact to visual character is considered **Less than Significant**.

Alternative 6: No Project

The SBSP Phase 1 Action at Pond A8, if implemented, would likely increase the current channel width by 50 to 90 feet through scouring. No loss of wetland vegetation would occur under the No Project alternative. No permanent structures would be placed within the landscape. These changes would be self-sustaining and would not require the District to implement maintenance. The Alviso Slough Restoration Project would result in **No Impact** to the visual character.

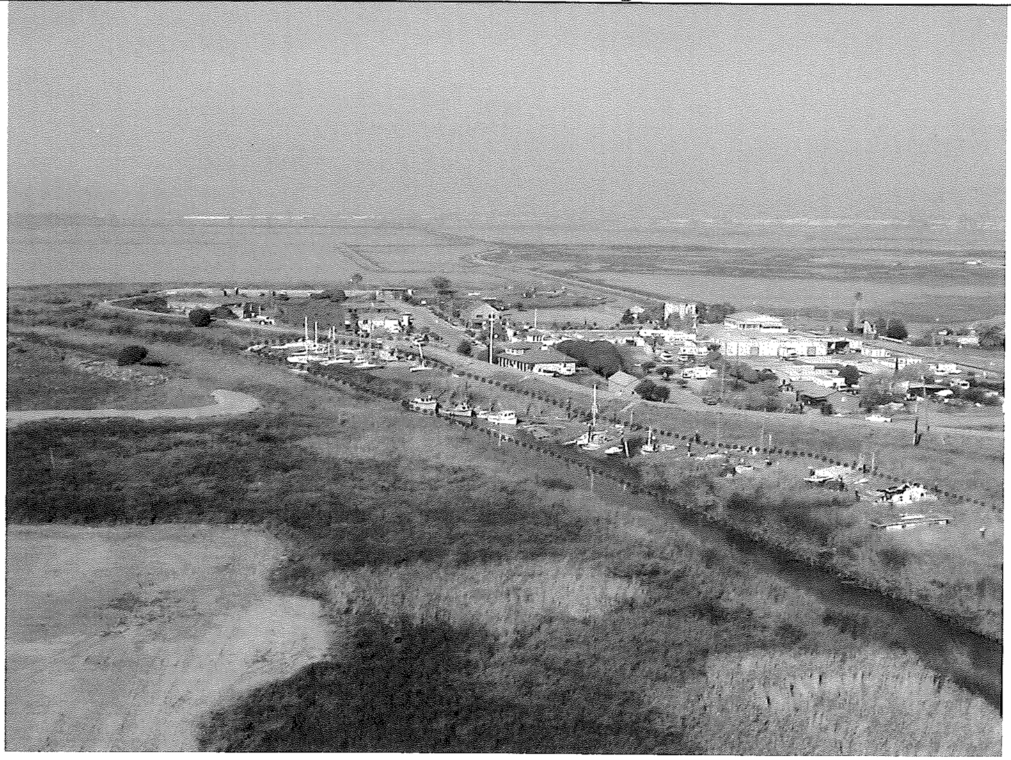
3.16.5 Sediment Disposal Options

Sediment disposal options include trucking, barging, or conveying (e.g., slurry pipeline) the dredged sediment to a location where it could be re-used, rather than trucking the material to the Newby Island Landfill, as described in Chapter 2. Like trucking, these disposal options are temporary in nature and would not have a permanent adverse impact on scenic vistas or the visual character of the Project area. However, a re-use solution where the sediment would not require drying at the proposed staging areas in Alviso would alleviate that temporary circumstance.

Photo Simulations:
Alternative 1

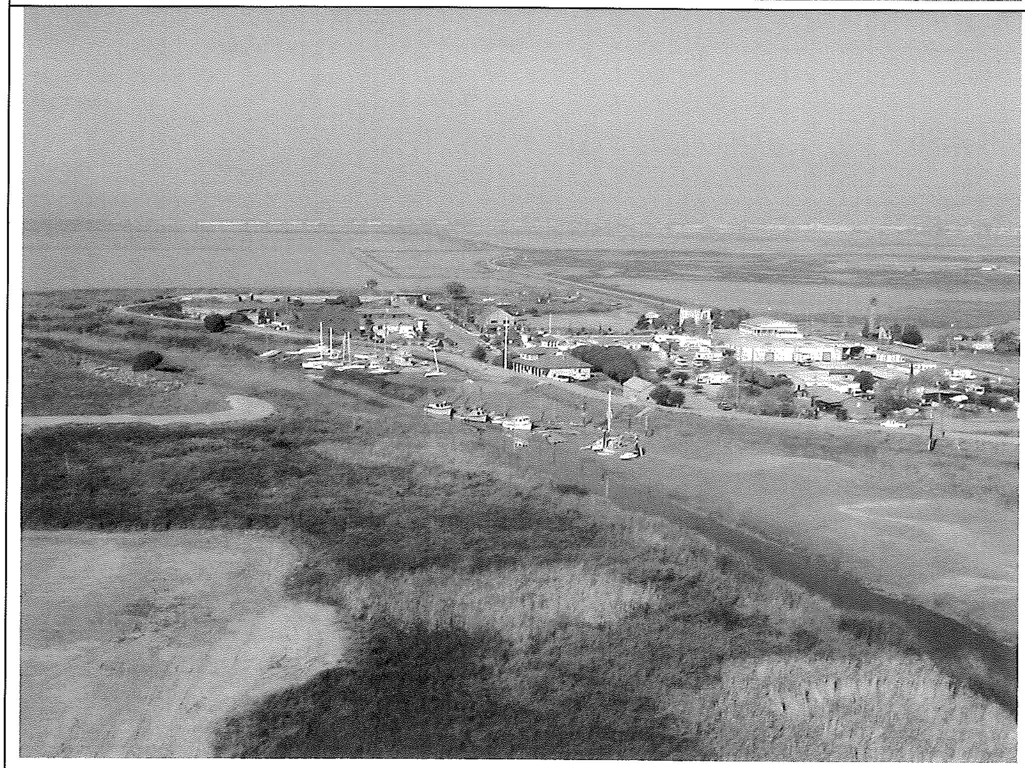
Figure 3.16-1 Alternative 1 Photo Simulation

Photo No. 1253
Photo Date/Time: February 3, 2005 at approx. 4p.m. (low tide conditions)
Description: View of Alviso Slough and SBYC from the west side of the slough, looking downstream and across the northern edge of Alviso



EXISTING CONDITIONS

Outline indicates proposed construction area.



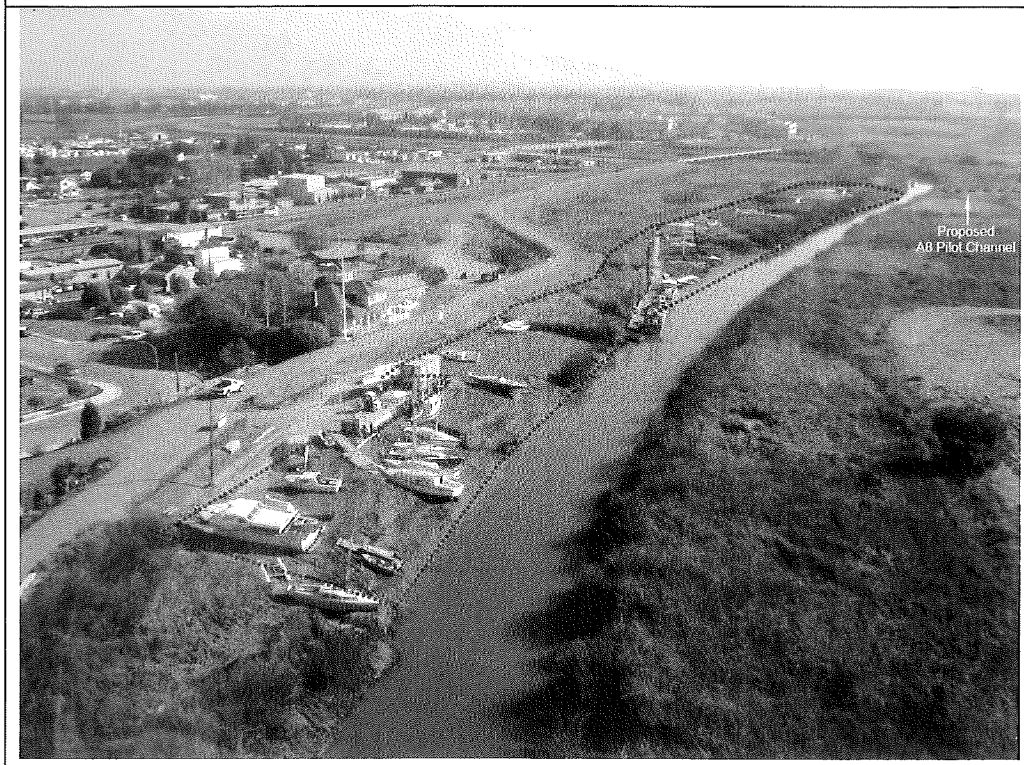
ALTERNATIVE 1

Results after 2.6 acres vegetation and root mass removal to 4-foot depth.

Visual simulation at low tide conditions. At low tide, mudflats would appear wherever vegetation and root mass are removed.

Figure 3.16-2 Alternative 1 Photo Simulation

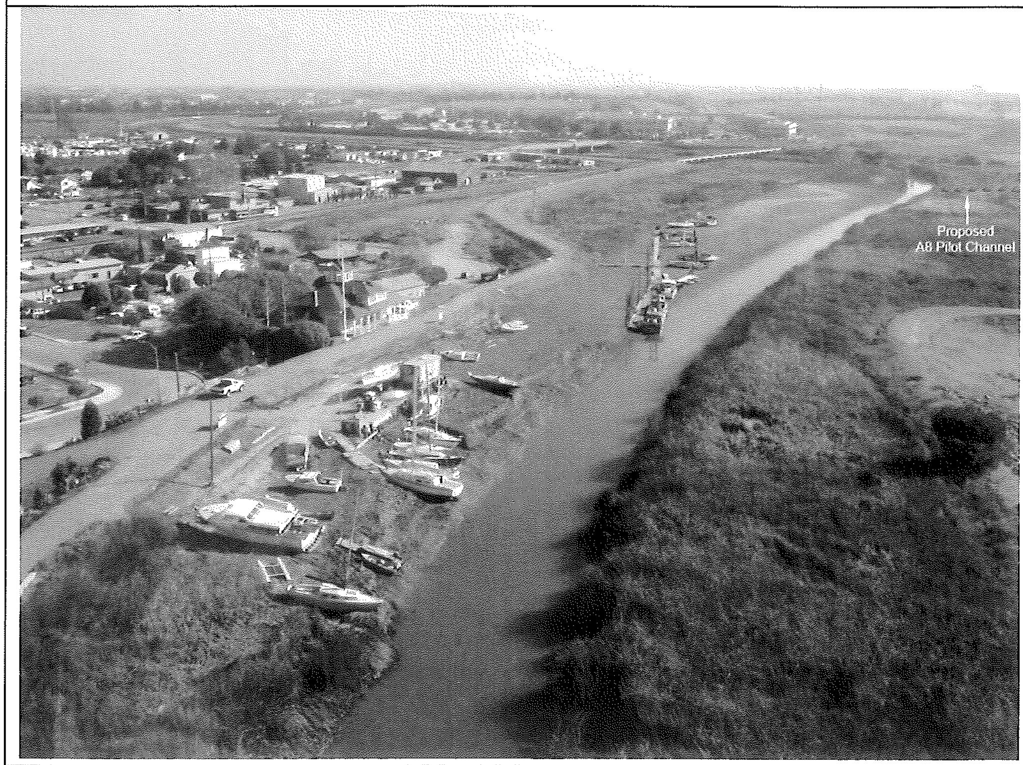
Photo No.: 1255
Photo Date/Time: February 3, 2005 at approx. 4p.m. (low tide conditions)
Description: View of Alviso Slough and SBYC, looking upstream towards San Jose



EXISTING CONDITIONS

Outline indicates proposed construction area.

Proposed location for pilot channel from SBSP Phase 1 Notch added for reference.



ALTERNATIVE 1

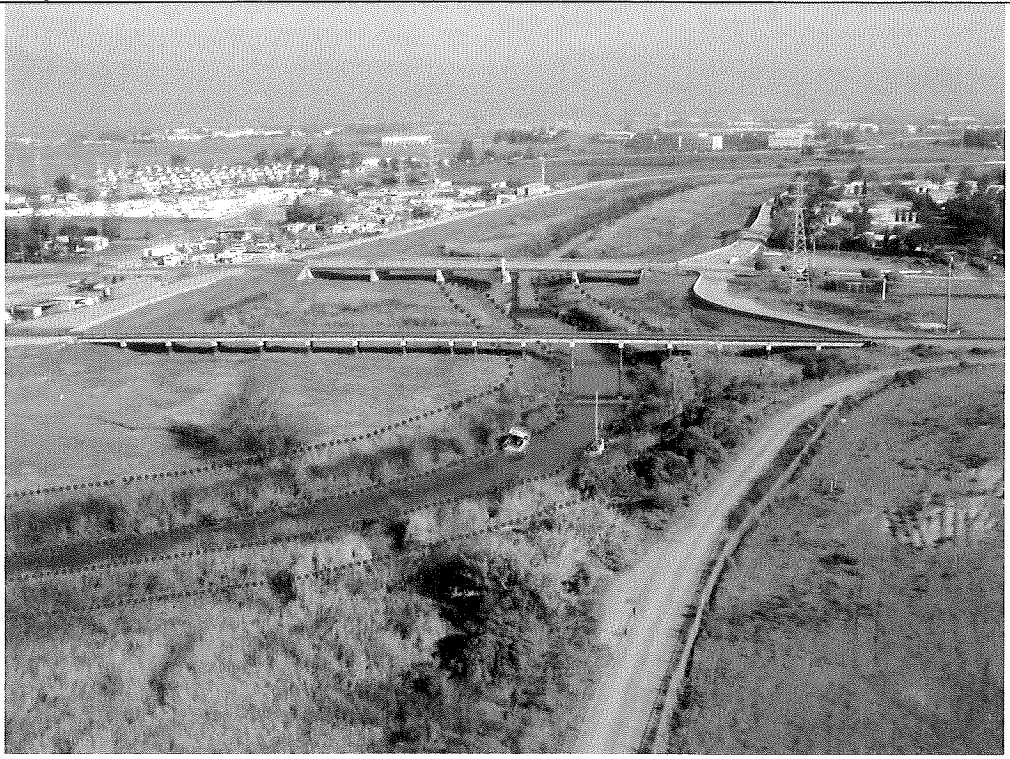
Results after 2.6 acres vegetation and root mass removal to 4-foot depth.

Visual simulation at low tide conditions. At low tide, mudflats would appear wherever vegetation and root mass are removed.

Photo Simulations: Alternative 2

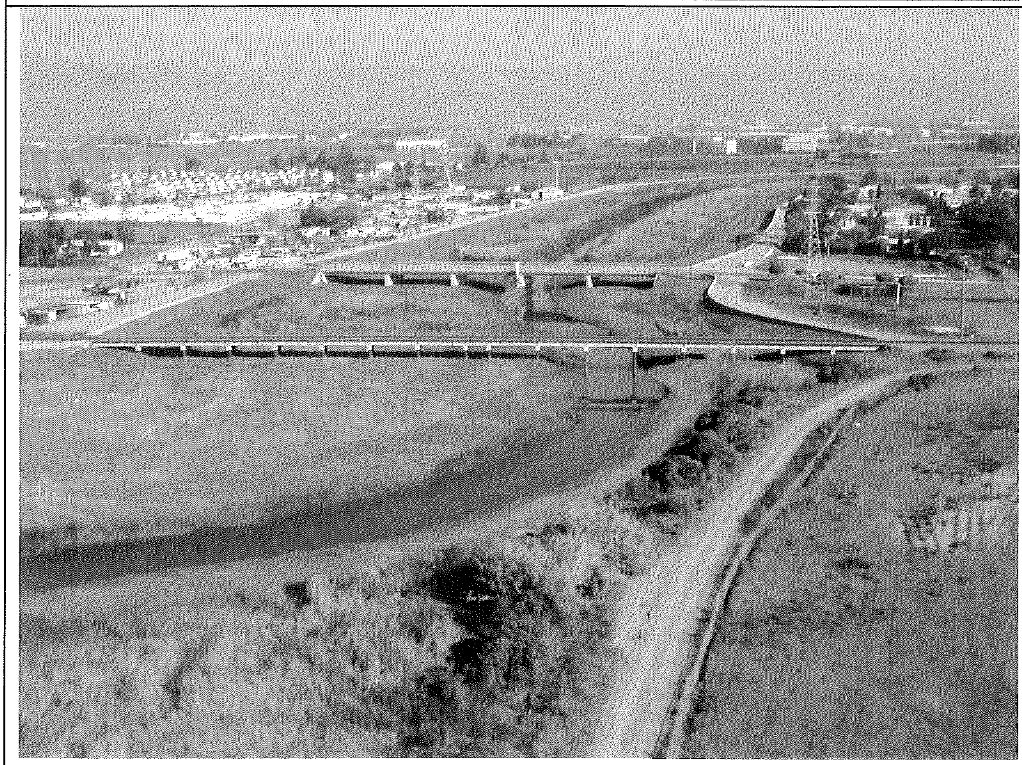
Figure 3.16-3 Alternative 2 Photo Simulation

Photo No. 1251
Photo Date/Time: February 3, 2005 at approx. 4p.m. (low tide conditions)
Description: View of Alviso Slough looking upstream and easterly towards Milpitas; UPRR bridge and Gold Street Bridge are in view.



EXISTING CONDITIONS

Outline indicates proposed construction area.



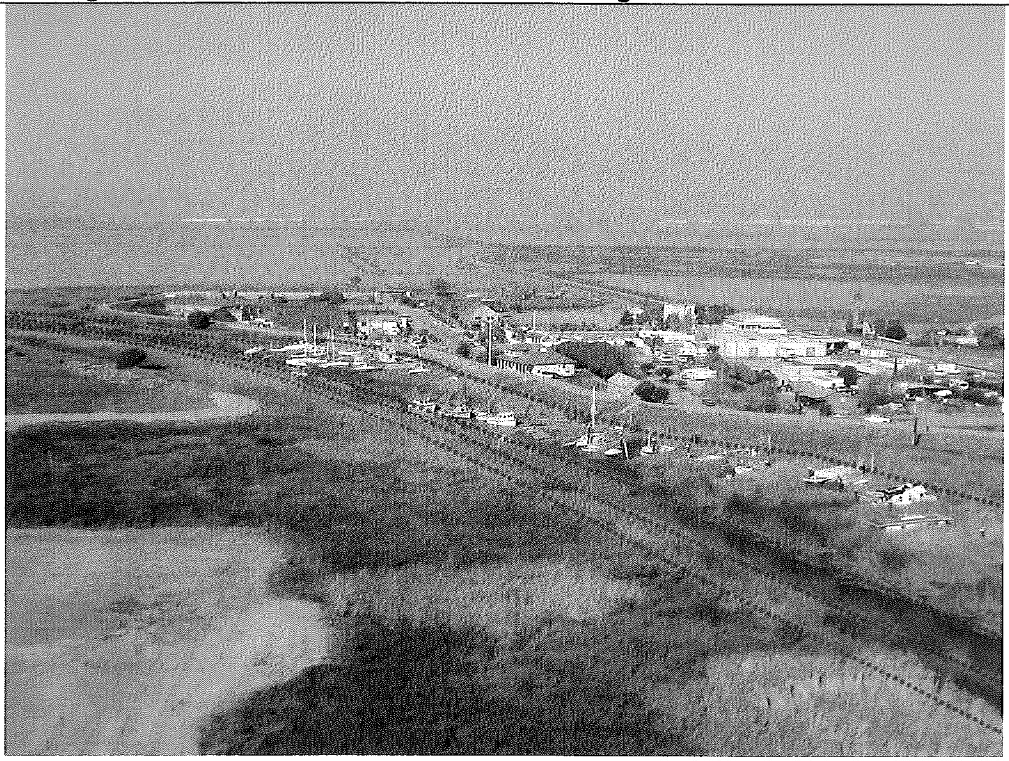
ALTERNATIVE 2

Results after 7.0 acres vegetation and root mass removal to 4 feet.

Photo simulates low tide conditions. At low tide, mudflats would appear wherever vegetation and root mass is removed without dredging.

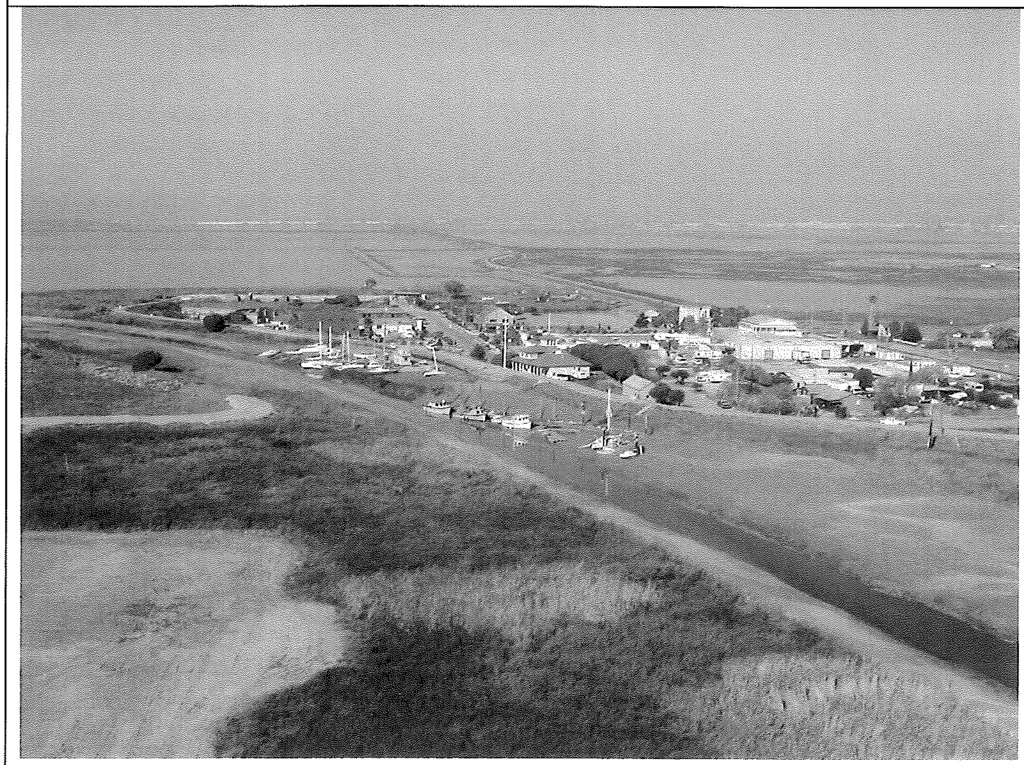
Figure 3.16-4 Alternative 2 Photo Simulation

Photo No.: 1253
Photo Date/Time: February 3, 2005 at approx. 4p.m. (low tide conditions)
Description: View of Alviso Slough and SBYC from the west side of the slough, looking downstream and across the northern edge of Alviso



EXISTING CONDITIONS

Outline indicates construction area.



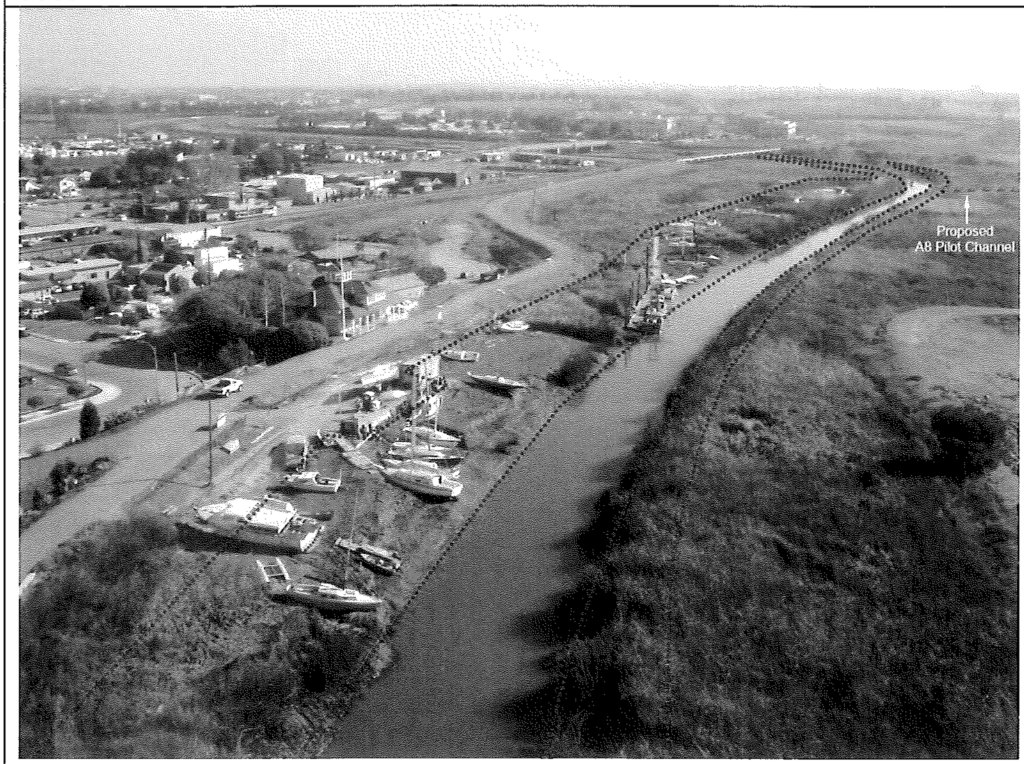
ALTERNATIVE 2

Results after 7.0 acres vegetation and root mass removal to 4 feet.

Photo simulates low tide conditions. At low tide, mudflats would appear wherever vegetation and root mass is removed without dredging.

Figure 3.16-5 Alternative 2 Photo Simulation

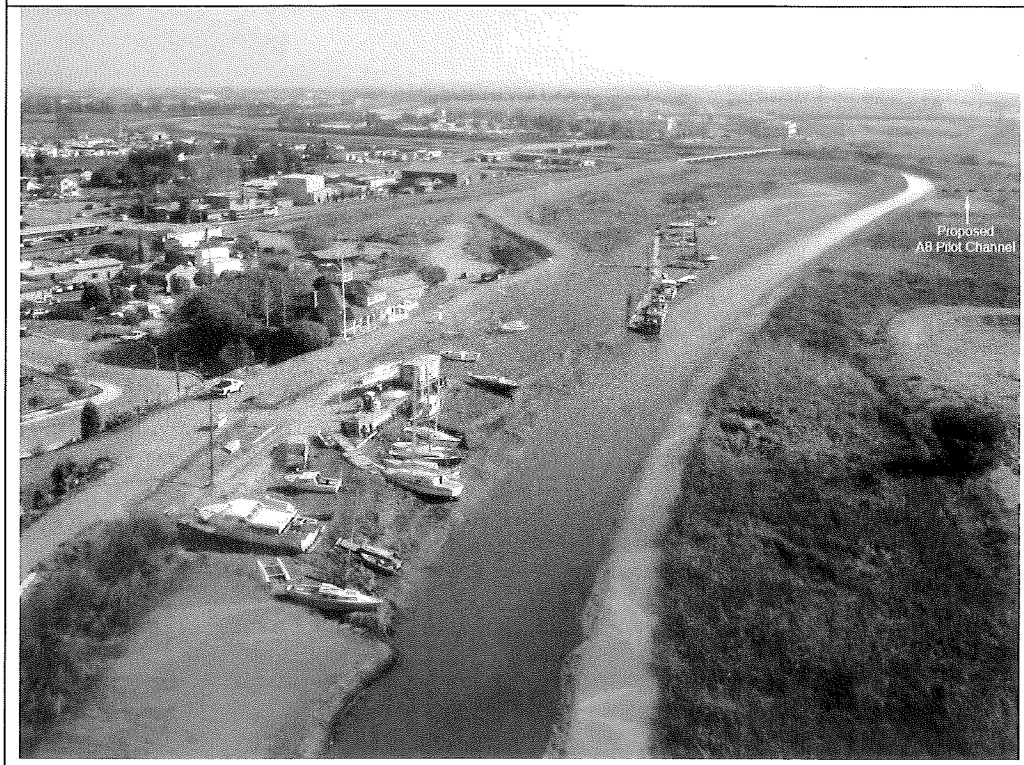
Photo No.: **1255**
Photo Date/Time: **February 3, 2005 at approx. 4p.m. (low tide conditions)**
Description: **View of Alviso Slough and SBYC, looking upstream towards San Jose**



EXISTING CONDITIONS

Outline indicates proposed construction area.

Proposed location for pilot channel from SBSP Phase 1 Notch added for reference.



ALTERNATIVE 2

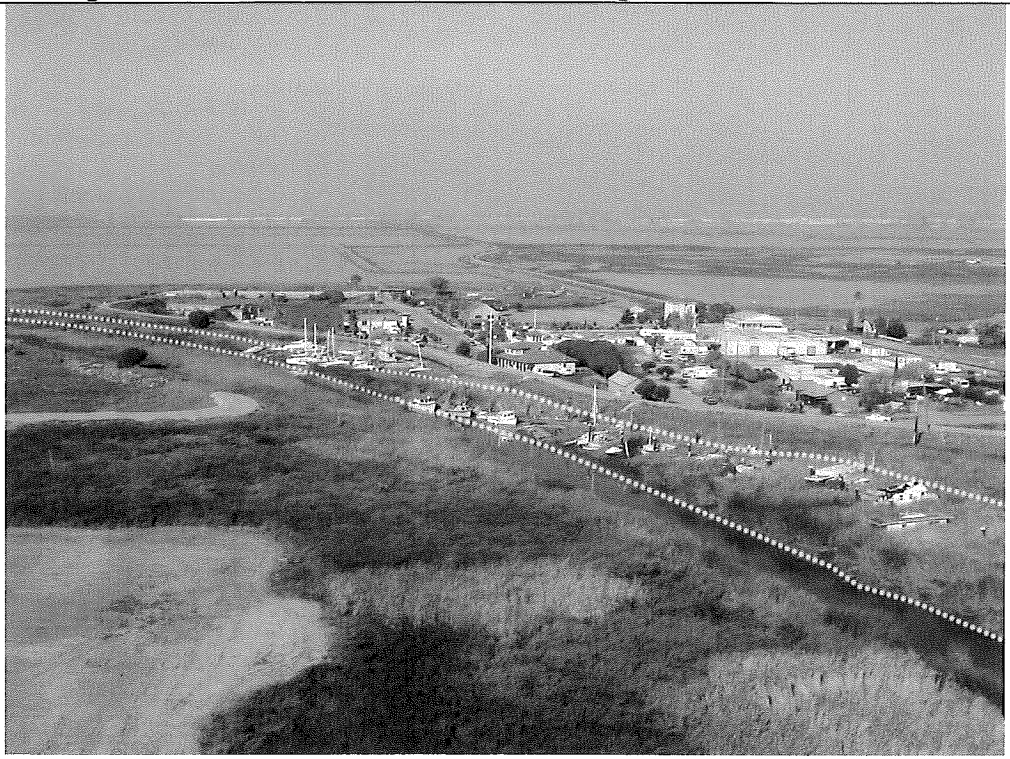
Results after 7.0 acres of vegetation and root mass removal to 4 feet.

Photo simulates low tide conditions. At low tide, mudflats would appear wherever vegetation and root mass is removed without dredging.

Photo Simulations:
Alternative 3

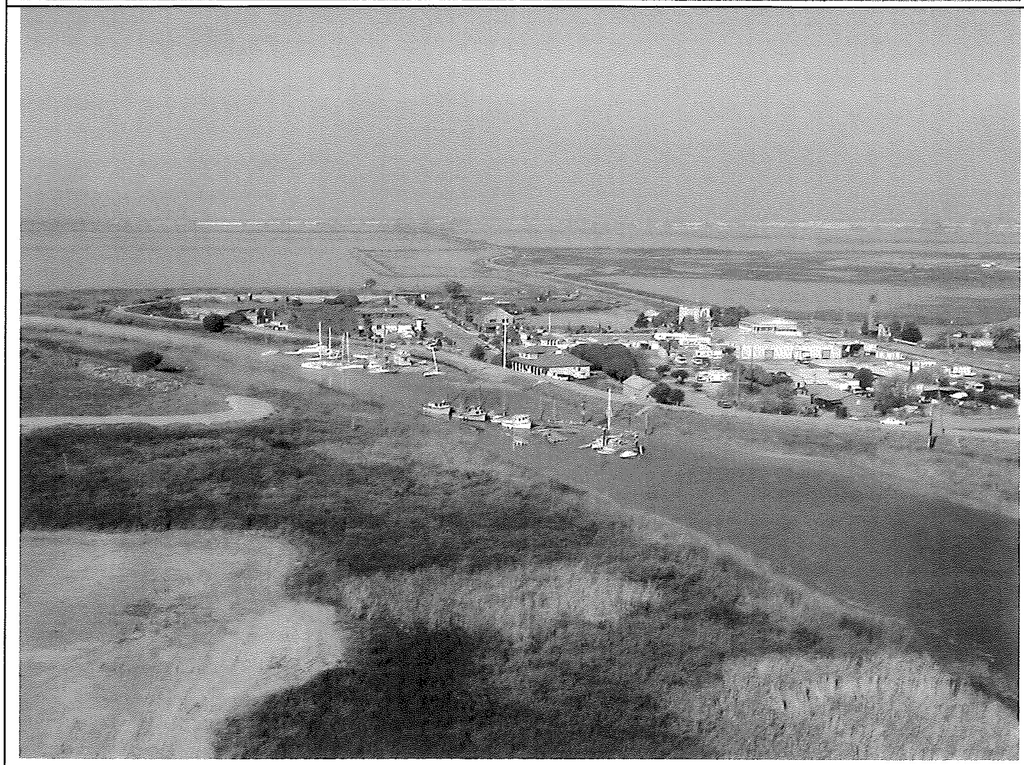
Figure 3.16-6 Alternative 3 Photo Simulation

Photo No.: 1253
Photo Date/Time: February 3, 2005 at approx. 4p.m. (low tide conditions)
Description: View of Alviso Slough and SBYC from the west side of the slough, looking downstream and across the northern edge of Alviso



EXISTING CONDITIONS

Outline indicates proposed construction area.



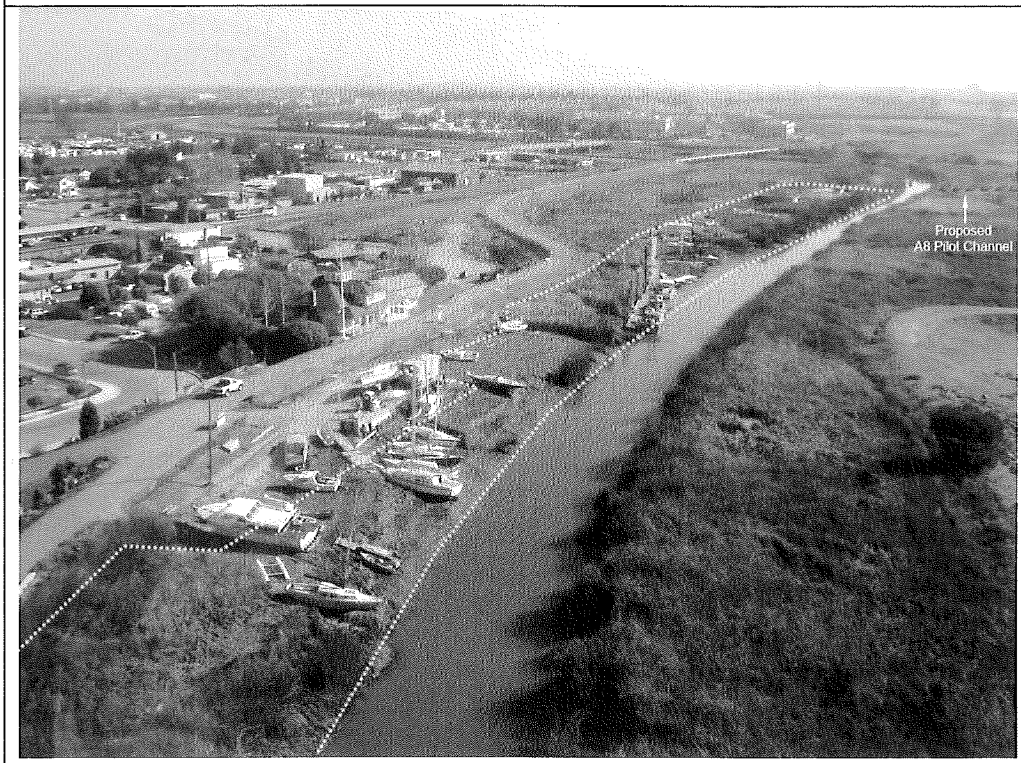
ALTERNATIVE 3

Results after 3.7 acres of vegetation and root mass removal and dredging to 8 feet.

Photo simulates low tide conditions.

Figure 3.16-7 Alternative 3 Photo Simulation

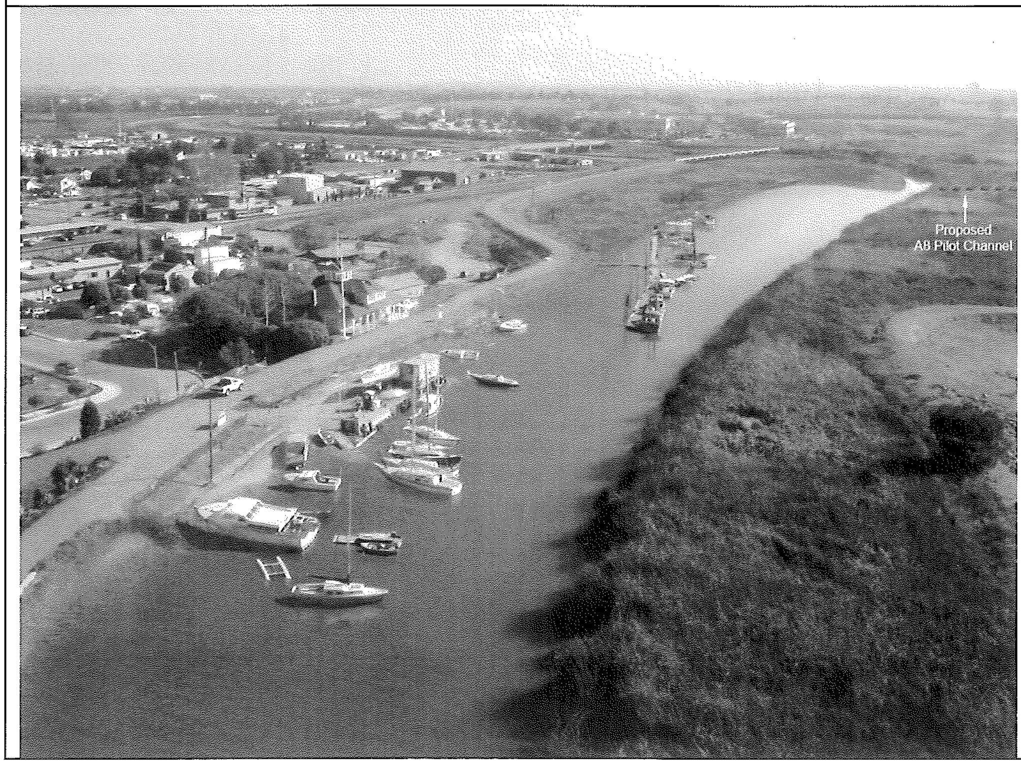
Photo No.: 1255
Photo Date/Time: February 3, 2005 at approx. 4p.m. (low tide conditions)
Description: View of Alviso Slough and SBYC, looking upstream towards San Jose



EXISTING CONDITIONS

Outline indicates proposed construction area.

Proposed location for pilot channel from SBSP Phase 1 Notch added for reference.



ALTERNATIVE 3

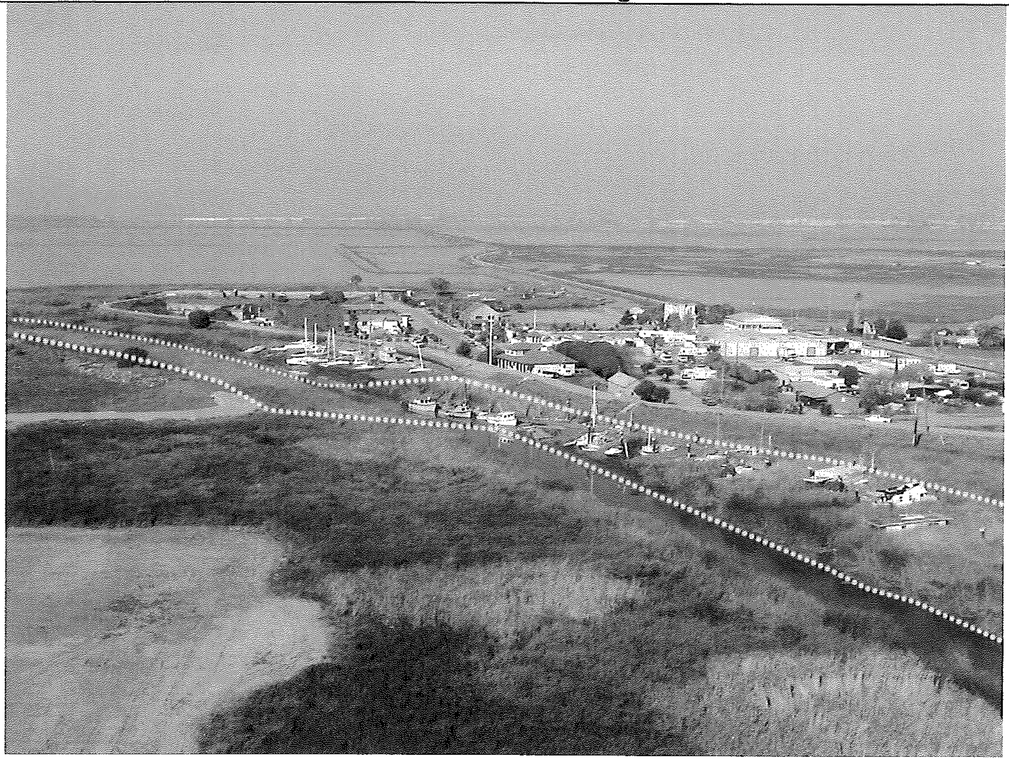
Results after 3.7 acres of vegetation and root mass removal and dredging to 8-foot depth.

Visual simulation at low tide conditions. This alternative would allow for two-way boat traffic at all times.

Photo Simulations:
Alternative 4

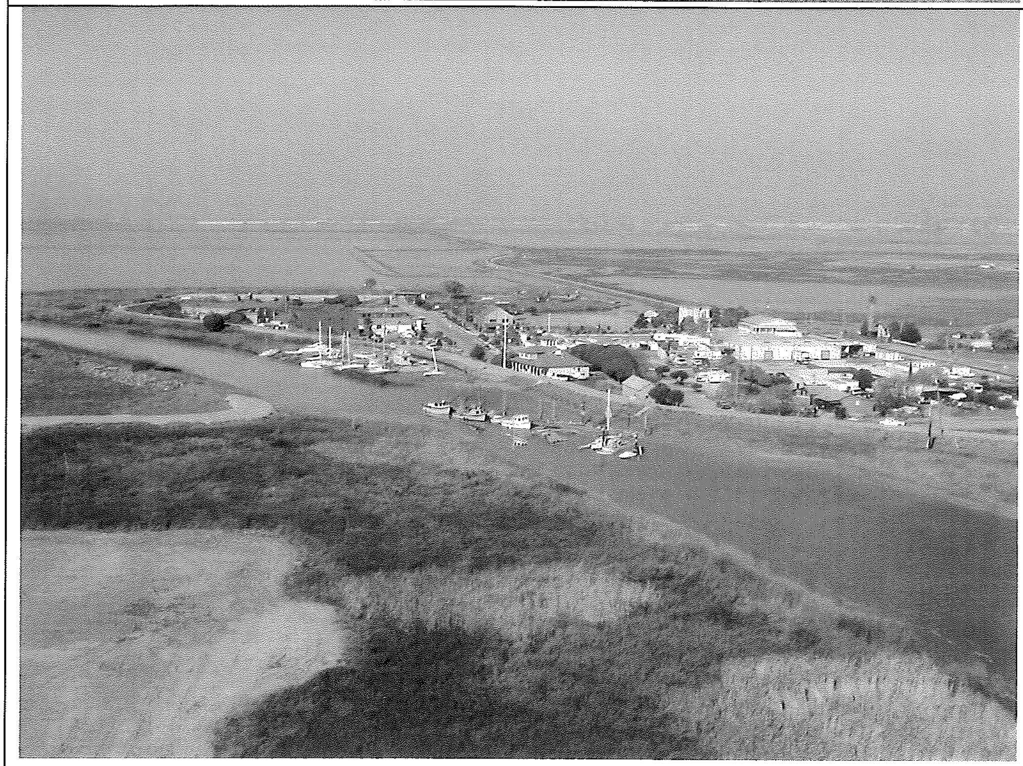
Figure 3.16-8 Alternative 4 Photo Simulation

Photo No.: 1253
Photo Date/Time: February 3, 2005 at approx. 4p.m. (low tide conditions)
Description: View of Alviso Slough and SBYC from the west side of the slough, looking downstream and across the northern edge of Alviso



EXISTING CONDITIONS

Outline indicates proposed construction area.



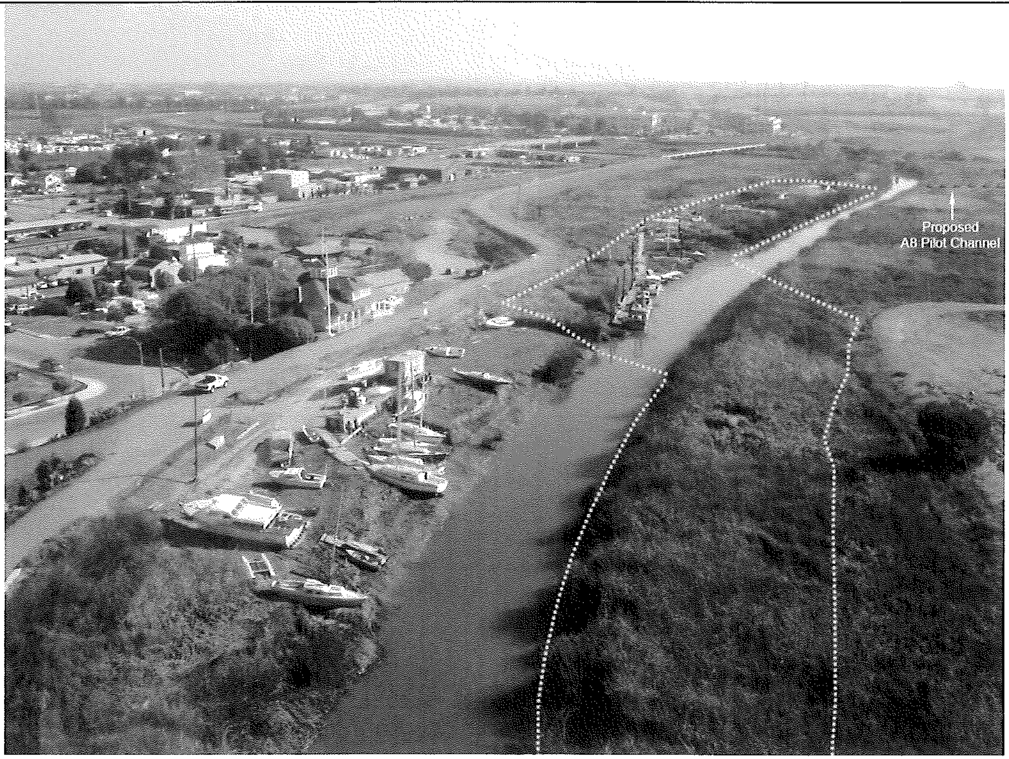
ALTERNATIVE 4

Results after 6.2 acres of vegetation and root mass removal and dredging to 16 feet.

Photo simulates low tide conditions.

Figure 3.16-9 Alternative 4 Photo Simulation

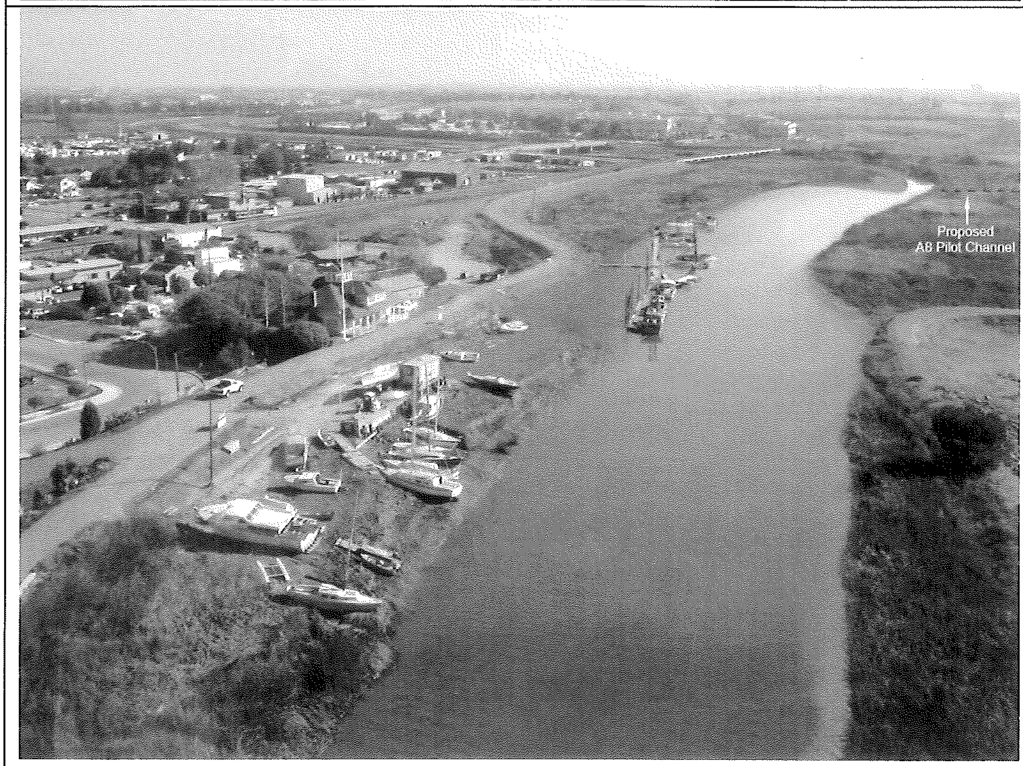
Photo No.: 1255
Photo Date/Time: February 3, 2005 at approx. 4p.m. (low tide conditions)
Description: View of Alviso Slough and SBYC, looking upstream towards San Jose



EXISTING CONDITIONS

Outline indicates proposed construction area.

Proposed location for pilot channel from SBSP Phase 1 Notch added for reference.



ALTERNATIVE 4

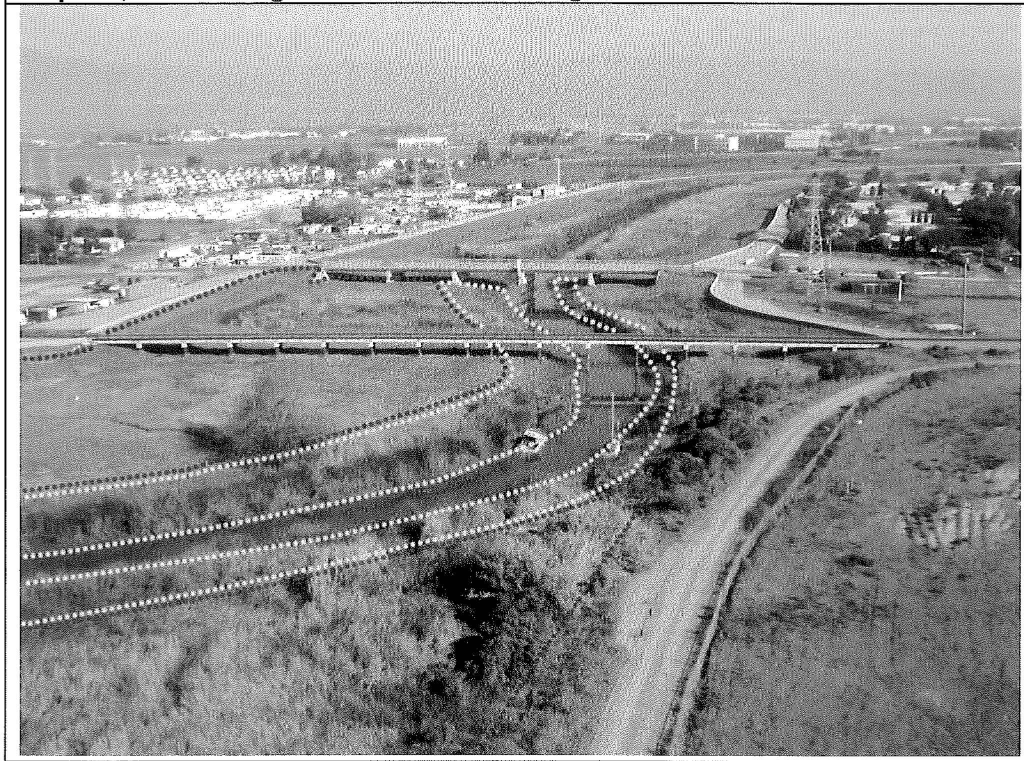
Results after 6.2 acres of vegetation and root mass removal and dredging to 16-foot depth.

Visual simulation at low tide conditions. As with Alternative 3, this alternative would also allow for two-way boat traffic at all times.

Photo Simulations:
Alternative 5

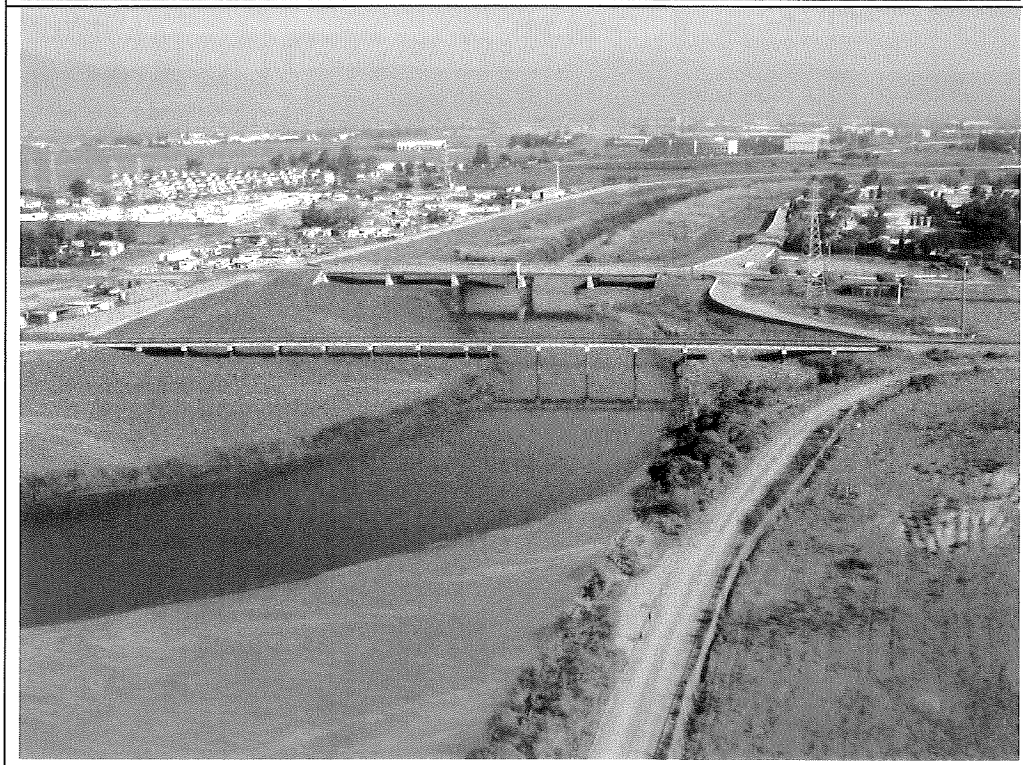
Figure 3.16-10 Alternative 5 Photo Simulation

Photo No.: **1251**
Photo Date/Time: **February 3, 2005 at approx. 4p.m. (low tide conditions)**
Description: **View of Alviso Slough looking upstream and easterly towards Milpitas; UPRR bridge and Gold Street Bridge are in view.**



EXISTING CONDITIONS

Outline indicates proposed construction areas (red is vegetation removal only; yellow is dredging).



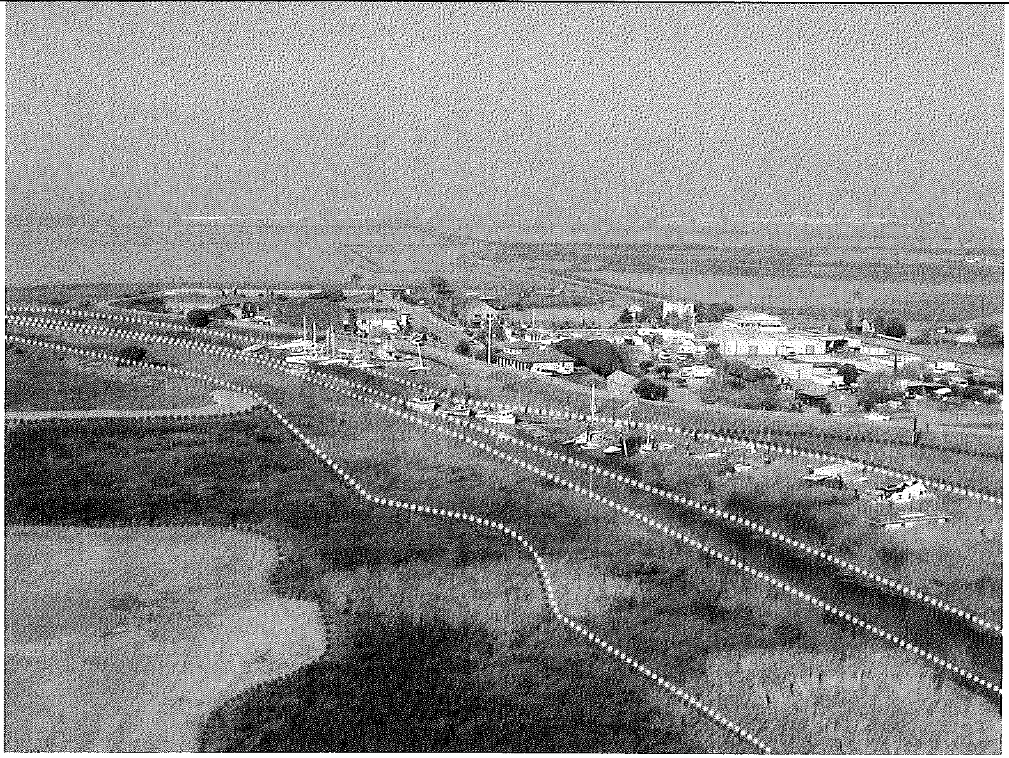
ALTERNATIVE 5

Results after 15.3 acres of vegetation and root mass removal to 4 feet with an additional 9.7 acres of dredging to 10 feet.

Photo simulates low tide conditions. At low tide, mudflats would appear wherever vegetation and root mass is removed without dredging.

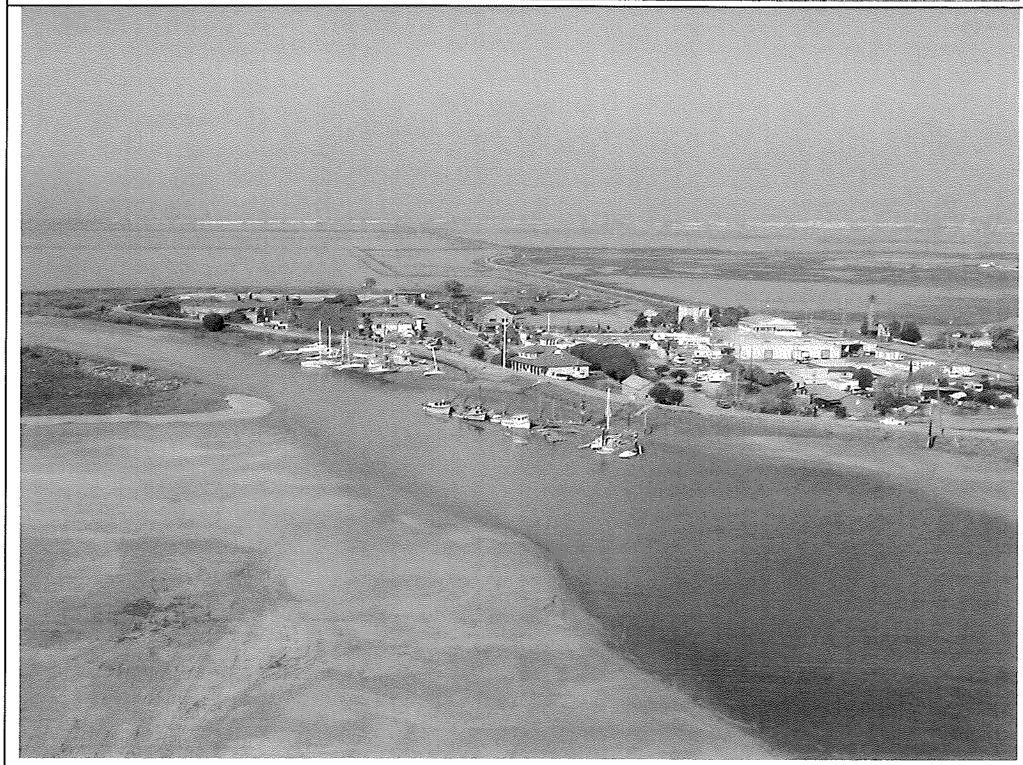
Figure 3.16-11 Alternative 5 Photo Simulation

Photo No.: 1253
Photo Date/Time: February 3, 2005 at approx. 4p.m. (low tide conditions)
Description: View of Alviso Slough and SBYC from the west side of the slough, looking downstream and across the northern edge of Alviso



EXISTING CONDITIONS

Outline indicates proposed construction area (red is vegetation removal only; yellow is dredging).



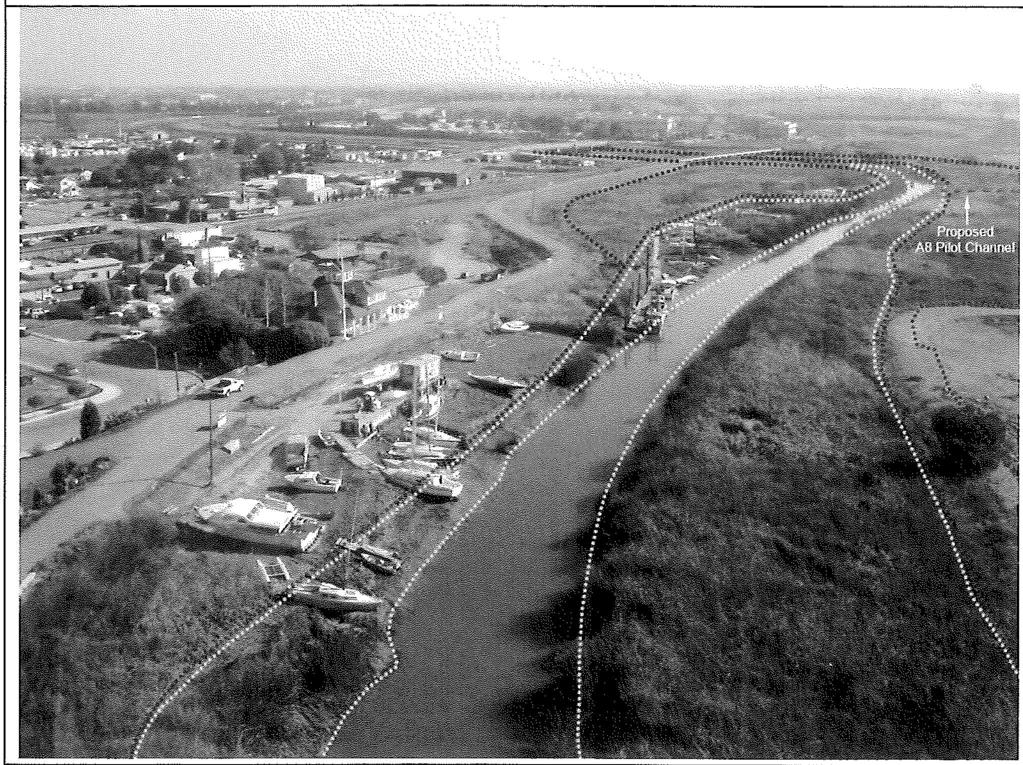
ALTERNATIVE 5

Results after 15.3 acres of vegetation and root mass removal to 4-foot depth and an additional 9.7 acres of dredging to 10-foot depth.

Visual simulation at low tide conditions. At low tide, mudflats would appear wherever vegetation and root mass are removed. This alternative replicates early 1980s slough conditions.

Figure 3.16-12 Alternative 5 Photo Simulation

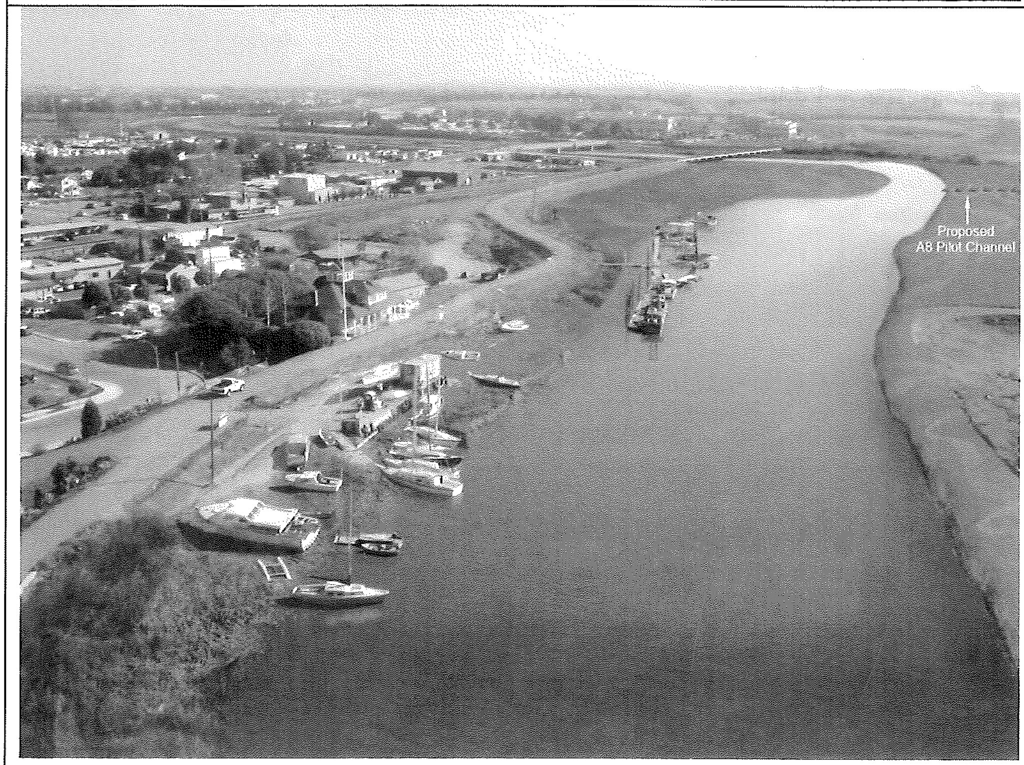
Photo No.: 1255
Photo Date/Time: February 3, 2005 at approx. 4p.m. (low tide conditions)
Description: View of Alviso Slough and SBYC, looking upstream towards San Jose



EXISTING CONDITIONS

Outline indicates proposed construction area (red is vegetation removal only; yellow is dredging).

Proposed location for pilot channel from SBSP Phase 1 Notch added for reference.



ALTERNATIVE 5

Results after 15.3 acres of vegetation and root mass removal to 4 feet and an additional 9.7 acres of dredging to 10 feet.

Photo simulates low tide conditions. At low tide, mudflats would appear wherever vegetation and root mass is removed without dredging.

This page intentionally left blank.

3.17 SOCIAL AND ECONOMIC EFFECTS, INCLUDING ENVIRONMENTAL JUSTICE (SOCIOEC)

This section describes the existing social and economic conditions of the Project area and analyzes potential impacts of the Alviso Slough Restoration Project to the social and economic conditions in the Project area, including Environmental Justice. Table 3.17-1 shows applicable plans and policies related to social and economic resources.

3.17.1 Regulatory Setting

Table 3.17-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
FEDERAL	
Executive Order (EO) 12898	Executive Order (EO) 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" was issued on February 11, 1994 by President Clinton. EO 12898 requires all federal agencies to seek to achieve environmental justice by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. Each agency is required to "conduct its programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under, such programs, policies, and activities, because of their race, color, or national origin."
Council on Environmental Quality	The Council on Environmental Quality (CEQ) defines "minority populations" where "either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general populations or other appropriate unit of geographic analysis." Minority populations include individual(s) who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic.
STATE	
California Environmental Protection Agency, Government Code *Government Code Section 65040.12*	The California Environmental Protection Agency (Cal/EPA) is committed to the achievement of environmental justice. Environmental Justice is defined in California law (Government Code section 65040.12) as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws and policies."
Environmental Justice Small Grant Program	California AB 2312 establishes the Environmental Justice Small Grant Program under the jurisdiction of the California Environmental Protection Agency; requires the agency to award grants on a competitive basis to nonprofit entities and federally recognized tribal governments for certain listed purposes; requires the agency to adopt regulations to implement the grant program; and, requires the agency to review, evaluate, and select grant recipients and screen grant applications to ensure that they meet the

Table 3.17-1 Applicable Plans and Policies

Agency + Plan or Policy	Overview & Applicability
	requirements of the bill. Status: Chaptered by Secretary of State 9/27/02
California Resources Agency *Government Code Section 65040.12 and Public Resources Code Section 72000*	California law defines Environmental Justice as "the fair treatment of people of all races, cultures and income with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies". The concept behind the term "environmental justice" is that all people – regardless of their race, color, nation or origin or income – are able to enjoy equally high levels of environmental protection. Environmental justice communities are commonly identified as those where residents are predominantly minorities or low-income; where residents have been excluded from the environmental policy setting or decision-making process; where they are subject to a disproportionate impact from one or more environmental hazards; and where residents experience disparate implementation of environmental regulations, requirements, practices and activities in their communities. Environmental justice efforts attempt to address the inequities of environmental protection in these communities. It is the policy of the Resources Agency that the fair treatment of people of all races, cultures and income shall be fully considered during the planning, decision-making, development, and implementation of all Resources Agency programs, policies and activities. The intent of this policy is to ensure that the public, including minority and low-income populations, are informed of opportunities to participate in the development and implementation of all Resources Agency programs, policies and activities, and that they are not discriminated against, treated unfairly, or caused to experience disproportionately high and adverse human health or environmental effects from environmental decisions.
CEQA Guidelines *Section 15131*	There are no specific requirements for the analysis of socioeconomic and environmental justice issues under state law. CEQA Guidelines Section 15131(a) through (c) provides guidance on the discussion of economic and social effects in an EIR. Specifically, such effects may be included in an EIR but "shall not be treated as significant effects on the environment." However, economic and social effects may be used to determine the significance of physical changes caused by a project, but these changes "need not be analyzed in any detail greater than necessary to trace the chain of cause and effect." CEQA Guidelines provide for the consideration of economic, social, and particularly housing factors together with technological and environmental factors to determine whether changes in a project are feasible to reduce or avoid the significant effects on the environment identified in the EIR.
LOCAL	
City of San Jose *City of San Jose 2020 General Plan*	*Socioeconomics* The City of San Jose does not include relevant strategies, policies, and implementation measures pertaining to socioeconomics in its General Plan. *Environmental Justice* The Land Use Element of the City of San Jose 2020 General Plan (2004) (City of San Jose 2004) provides the following goal pertaining to environmental justice: "Provide decent housing in a livable environment for all persons, including the homeless, regardless of such factors as age, race, sex, marital status, ethnic background or income."

3.17.2 Physical Setting

As this section focuses on socioeconomic and environmental justice issues, a number of topics are covered under physical setting, including:

- Land uses / characteristics and their influence on economic and recreational opportunities;
- Demographics including population, employment, poverty rates, and ethnic diversity; and
- Infrastructure located in and around the Project area.

Regional

The Project area is situated at the urban edge of the City of San Jose, where land uses transition abruptly from urban to a vast expanse of open spaces, salt ponds, waterways, and the San Francisco Bay (see Figure 1-2). The Project area is located adjacent to the larger 8,000-acre Alviso pond complex, which is managed by the USFWS. The Alviso pond complex consists of 25 ponds on the shores of the South Bay within the cities of Fremont, San Jose, Sunnyvale and Mountain View, in Santa Clara and Alameda Counties. Local residents and visitors from the Bay Area use the Alviso pond complex for a variety of recreation activities, including fishing, boating, bicycling, hiking, wildlife observation, hunting, and outdoor education. See Section 3.11 for more information about the array of outdoor recreational opportunities in the area.

Santa Clara County enjoys an ethnically diverse population and a generally robust economy fueled by Silicon Valley computer technology and many other private businesses and government job generators. Table 3.17-2 compares population, household population, jobs, and employed residents for the Bay Area, Santa Clara County, and Alviso (Census Tract 5046.02) for 2005. No residential uses exist within the immediate Project area (i.e., in and along the Slough). The percent of households employed in the Project area is lower than that of the County and Bay Area, as shown in the table, below.

Table 3.17-2 Population and Labor Force (Year 2005)

Area	Population	Jobs	Employed Residents	% Population Employed
Bay Area	7,091,700	3,516,903	3,225,119	45%
Santa Clara County	1,750,100	903,841	734,002	42%
Alviso Census Tract[1]	2,799	26,853	1,107	40%

[1] Includes Census Tract 5046.02; the Project site is entirely contained within Census Tract 5046.02. it should be noted that Tract 5046.02 includes areas (e.g., Milpitas) outside the Alviso community (please see Figure 3.17-1).

Source: ABAG Projections, 2007.

Project Area

General

South of the Alviso Slough Restoration Project area, urban land uses include residential, commercial, industrial, and infrastructure. The historic community of Alviso is located immediately east of the Project area and contains mostly residences, light industry and a few small businesses. To the north and west, the Project area is surrounded by expansive open space consisting of bayshore mudflats, salt flats, salt marsh, salt evaporative ponds, creeks, flood control, and rural land and wildlife interpretative areas.

The Alviso Slough channel has gradually narrowed due to sediment accumulation and vegetation encroachment over many years. Anthropogenic influences and natural processes have resulted in a reduced channel width and depth that precludes the community's ability to use the slough, as it once did, for navigation and recreational access.

The available water recreation opportunities on Alviso Slough in decades past likely generated more boating visits to Alviso than there are today, although historic boat visit data is not available. Based on conversations with long time users of the Slough, the area had many more boaters and fisherman enjoying the Slough (Robinson, 2007). In the 1970's, the SBYC had 30 fully operable boat spaces earning market rate rents. The additional boat trips would have resulted in local retail expenditures. The California Department of Boating and Waterways (CDBW) found that the typical California boater spent approximately $136 per day on boating trips in 2002 (California Department of Boating and Waterways 2002). The same study found boaters spend approximately $30 per day on grocery and convenience goods and $8.56 on restaurants per day. Inflated to current dollars, the typical California boater spends approximately $45 per day in restaurant and grocery goods per day (Bureau of Economic Analysis 2007). To the extent more boaters visited the Slough in the 1970's, Alviso likely captured more boat recreation dollars, accessing nearby restaurant and convenience store establishments.

Socioeconomic Factors

South Bay Yacht Club

As described in Section 3.11, Recreation, situated along the bank of Alviso Slough within the Project area, the SBYC was originally formed in 1888 as the South Bay Yachting Association. In 1896, the club was re-formed as the SBYC and a clubhouse was built in Alviso in 1903. The clubhouse, with a pub style bar, dining area, restrooms, and approximately 32 boat spaces, was moved in 1983 to its current position on the levee because of continued flooding. The SBYC docks extend upstream from the clubhouse about 850 feet and are accessed via two gated and locked gangways from the levee. The SBYC is private but has one slip dedicated for public users. Although the berths have been largely filled in with sediment and vegetation growth, there are a currently a few dozen boats moored at the docks. Boat types include several large sailboats and powerboats over 30 feet in length as well as smaller craft. In recent years, some dilapidated boats moored in the area have been removed at the request of BCDC. A few large commercial fishing boats used on the San Francisco Bay are also kept at the SBYC docks and can access the Bay only during high tides, which must be carefully timed.

Current boat rental rates range from $3.00 and $4.00 per linear foot per month for the commercial boat slips and approximately $1.00 per linear foot for the slips in dense vegetation. These are well below market rates for marina spaces in the Bay. For example, Coyote Point Yacht Club and San Leandro Marina charge approximately $7 per linear foot per month while Docktown Marina in Redwood City charges $6.75 per linear foot.

Blue Whale Sailing School

As described in Section 3.11, Recreation, the Blue Whale Sailing School, located along the levee of Alviso Slough adjacent to and downstream of the SBYC, was founded in 2000 as a charitable educational corporation. The facility consists of a portable trailer that serves as an office, a gravel parking area with space for about six vehicles, and a floating dock attached to a cement landing. The facility occupies about

300 feet of levee frontage on the slough, and covers an area of less than one-half acre. The school moors several small and medium sized sailboats along the slough and at the school's floating dock, and other boats are beached near the office. The landing and dock at the Blue Whale Sailing School is posted by BCDC as public shoreline.

Alviso Levee Trail

As described in Section 3.11, Recreation, a gravel trail runs on the top of the Alviso levee through the Project area. This segment of trail has not been officially opened by the City of San Jose, although some recreation improvements have recently been installed, such as cement benches with educational signage incorporated into them. The slough in this area is posted by BCDC as public shoreline. The City and the District intend to provide the trail access on the levee under an official Joint Trail Agreement, with additional improvements including signage and fencing to discourage trail users from crossing the railroad tracks. (Occasional trail users cross the tracks now, and have also been observed using the railroad bridge itself as a shortcut to roads and trails on the opposite side.)

Alviso Historic District

As described in Section 3.11, Recreation, bike riders and walkers, as well as people touring by car, may take advantage of sightseeing opportunities in and around Alviso, particularly in Alviso's Historic District. The 130-year old town is listed in the National Register of Historic Places. The Historic District includes the old Bayside Cannery, adjacent to the Alviso Levee and the Alviso Marina County Park. The building is unoccupied and in poor condition; the San Francisco Bay Bird Observatory operates its headquarters out of a trailer on the property. Nearby are the 1887 Tilden-Laine house, the best example of Victorian architecture remaining in town, and the adjacent Laines Grocery building, a wooden building dating to the earliest days of the community. Additional historic structures marked with commemorative plaques are on the opposite side of the downtown area, along El Dorado Street. The SBYC's clubhouse, as described above, is over 100 years old. Drawbridge, a ghost town dating back to the late 1800s, is in the marsh along the railroad tracks about two miles north of Alviso. The site is no longer open to the public, but remains of high interest to some area visitors.

Alviso Marina County Park

As described in Section 3.11, Recreation, the Alviso Marina County Park, which was renovated in 2005, provides a paved parking lot with space for about 60 vehicles, picnic sites, a restroom and drinking water, a boardwalk trail and wildlife observation deck, and interpretive signage. The County Park offers nearly unobstructed views of the lands and wildlife, particularly waterfowl, found in the immediate salt ponds as well as outward vistas to the San Francisco Bay and surrounding hills. Walkers, bicyclists, birders, and others use the Alviso Marina County Park as a parking and meeting point. According to the Santa Clara Parks and Recreation Strategic Plan, the park receives an average of more than 30,000 visits annually. The County Park offers recreationists easy access to the Alviso Slough Loop Trail (part of the Bay Trail), which loops around ponds A9-A14 of the Refuge. The boat ramp at the County Park (the only ramp in the Alviso area) is currently unusable due to sedimentation and subsequent encroachment by vegetation. Construction of a new boat launch ramp and related facilities on the slough within an addition to the Alviso Marina County Park is expected to occur in the future.

Recreation and Hunting

The Alviso Slough Restoration Project is bordered by Ponds A12 and A8. Pond A12 is considered baylands/open space and part of the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge). This pond is closed to the public and is not used for recreation, except seasonally by hunters. Pond A8 is also considered baylands/open space. Bicyclists, hikers, and birders use the levees along Alviso Slough and Ponds A8 and A12 regularly. In addition, residential and commercial uses are located in the community of Alviso to the east of Pond A8, and Alviso Slough.

Many fish species present in the Bay are also present in Alviso Slough (see Section 3.3, Biological Resources – Aquatic). Visitors are allowed to fish from boats in the Bay and sloughs, but not on any ponds within the Alviso pond complex. Due to poor access, little fishing presently appears to occur in the slough in the vicinity of Alviso (see Section 3.11).

Hunting on the ponds adjacent to Alviso Slough is regulated by the USFWS. Under the 2004 Hunt Plan Amendment for the Refuge, Ponds A2E, AB1, AB2, A3W, A3N, A5, A7 and the northern portion of Pond A8 within the Alviso pond complex (see Figure 1-2) are open to hunting on Saturdays, Sundays, and Wednesdays for three months of the year (waterfowl hunting season is approximately mid-October to mid-January). A Refuge Special Use Permit is required. Some hunters walk in to the northern portion of Pond A8 from Gold Street in Alviso. Hunters can hunt from the levees and may use small private boats (electric or non-motorized only) to access the blinds. Boat access for hunters is through Coyote Slough or from the South Bay. Substantial vegetation in Alviso Slough prohibits direct access from Alviso Slough into the ponds. Hunting is not permitted on Ponds A9 - A15, on the opposite side of Alviso Slough from Ponds A5 - A8.

No recreational businesses operate within the Project area. Recreational businesses (e.g., bait shops, outdoor equipment stores) are located outside of the Project area in nearby cities. Other businesses that indirectly support recreational uses (e.g., restaurants, shops) are also located outside of the Project area. Other businesses and industries are located adjacent to the pond complexes; these businesses are protected from flood hazards by the levees located bayward of these businesses.

Commercial Fishing

Two shrimp harvesting companies have historically operated in the South Bay, one of which collected brine shrimp directly from salt ponds within the Alviso pond complex (Morris 2005). One commercial fisherman runs his fleet of three vessels from the SBYC docks.

Currently, brine shrimp harvesting occurs only within the Refuge's Mowry pond system outside the Alviso Slough Restoration Project area. Brine shrimp harvesting occurred within the Alviso pond complex prior to and during the greater SBSP Restoration Program's early Initial Stewardship Plan (ISP) implementation, but it no longer occurs within the Project area. It is estimated that pond restoration as part of the ISP has reduced brine shrimp harvests by one of the fishing companies, SF Bay Brands, though its business has not been substantially altered by any decline in brine shrimp population (Morris 2005).

California bay shrimp are present in the South Bay year-round, but they are most abundant from September through October and least abundant from March through April (Hansen 2003). Bay shrimp are sensitive to changes in salinity and water quality, and may abandon sloughs in the far South Bay for deeper, more saline waters during periods of high freshwater runoff. Recent changes in salinity (e.g., effluent from wastewater treatment plants) may have altered the distribution of bay shrimp, as this species has declined in abundance in the far South Bay in recent decades.

CDFG conducted a fisheries survey for shrimp and crabs within San Francisco Bay since 1980 (CDFG data Life Science 2004). California bay shrimp comprised 80 percent, 59 percent, and 79 percent of shrimp captures at three open water stations. At present, it is estimated that the lack of tidal action in the SBSP Restoration Project area, to which the Project site is adjacent, is causing the Bay to fill in much faster than it otherwise would and that thousands of acres of the South Bay have been lost to sport fishers and other recreational users (Laine 2005, per. comm.).

Environmental Justice

While not typically included in an EIR, the following discussion of environmental justice issues is included to address concerns stated during the scoping process. Specifically, members of the Alviso community indicated that they have been neglected over the years (past environmental justice issues) as their existing community setting has been impacted by past land use and water use decisions and once-active waterway has filled-up with sediment from upstream flood control measures and other activities, thereby rendering it largely un-navigable, taking away a vital recreational and economic resource from the community. This is reflected in two of the Project Objectives stated in the Purpose and Need section in Chapter 1:

- Restore Alviso Slough's channel width and habitat to prior to 1983 conditions; and
- Improve the community's ability to pursue navigation, public access, and aesthetics to allow for the expansion of boating and other recreational and/or tourism opportunities.

While there are no specific requirements for the analysis of socioeconomic and environmental justice issues under state law, CEQA Guidelines Section 15131(a) through (c) provides guidance on the discussion of economic and social effects in an EIR. Specifically, such effects may be included in an EIR but "shall not be treated as significant effects on the environment." However, economic and social effects may be used to determine the significance of physical changes caused by a project.

To discuss environmental justice issues, federal EO 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" can provide helpful guidance. EO 12898 requires all federal agencies to seek to achieve environmental justice by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. Thus it is important to determine the ethnic makeup and economic status of the local community.

The community of Alviso is entirely within U.S. Census Tract 5046.02. According to the 2000 U.S. Census, Alviso is a predominantly Hispanic community with a concentration of low- and moderate-income households. The U.S. Census estimated that approximately 2,234 people lived in approximately 519 households in 2000. In 2005, the ABAG projected Alviso grew to approximately 2,800 residents. Table 3.17-3 compares the Association of Bay Area Governments (ABAG) projected 2005 population for the City of San Jose and Alviso Census Tract area. In 2005, Alviso accounted for less than 0.1 percent of San Jose's total population.

Past environmental justice issues (resulting from past government decisions and projects) are discussed in general terms beginning with Table 3.17-7.

Table 3.17-3 City and Alviso Population, 2005

Area	Population	Percent City Population
San Jose	993,000	100%
Alviso Census Tract	2,799	< 0.1
Source: ABAG Projections, 2005.		

According to the City of San Jose 2005-2010 Consolidated Plan, a United States Department of Housing and Urban Development (HUD) regulated document, Alviso is a minority-concentrated area. Alviso has a concentration of minority residents with more than half of its population of Hispanic descent, which HUD defines concentrated-minority area. According to the 2000 U.S. Census, approximately 75 percent of Alviso residents are of Hispanic descent compared to approximately 24 percent for the County overall.

The San Jose Consolidated Plan also identifies Alviso as a concentrated low- and moderate-income area with disproportionately larger share of low- and moderate-income households as defined by HUD. According to 2000 Census, approximately 60.1 percent of the household population within the Alviso Census Tract has an income of less than 80 percent of the area median income or lower. This is compared to 38.0 percent of Santa Clara County and 43.2 percent for the State of California, as depicted in Table 3.17-4. The City of San Jose 2005-2010 Consolidated Plan identifies the Alviso as a concentrated low- and moderate-income community, defined as an area with more than 50 percent of its population defined as having low- or moderate-incomes.

Table 3.17-4 Low/Moderate Income, 2000

Area	Household Population	Low/Moderate Population	% of Population
California	33,052,189	14,264,677	43.2%
Bay Area	6,641,060	2,692,038	40.5%
Santa Clara County	1,652,897	627,859	38.0%
Alviso Census Tract	2,166	1,302	60.1%

Source: HUD 2000 Census Data, Summarized Low/Mod Data, FY 2007, http://www.hud.gov/offices/cpd/systems/census/ca/index.cfm.

Notes:

HUD defines a low-income family as earning 50 percent or less of the HUD area median income and a moderate-income family is one that earns greater than 50 percent but no more than 80 percent of the HUD area median income.

HUD defines moderate-income as household or persons in household earning between 51 percent and 80 percent of area median income. Low-income are households or persons in households earning equal to or less than 50 percent of area median income.

According to 2005 ABAG Projections, the mean household income for Santa Clara County ($97,900) was slightly higher than that of the Bay Area ($97,400). However, mean household income for the Alviso Census Tract area is approximately 28 percent lower than that of the Bay Area and 29 percent lower than Santa Clara County. Table 3.17-5 compares mean household income for the Bay Area, Santa Clara County, and Alviso Census Tract area.

Table 3.17-5 Mean Household Income, 2005

Area	Mean Household Income	Compared to Bay Area
Bay Area	$97,400	NA
Santa Clara County	$97,900	101%
Alviso Census Tract	$69,700	72%
Source: ABAG Projections, 2005, 2007.		

For both the Bay Area and Santa Clara County, the largest industry sectors are health, educational and recreational services (30 percent and 27 percent); financial and professional service jobs (23 percent and 20 percent); and manufacturing, wholesale, and transportation (21 percent and 31 percent). This is compared to Alviso where more than half of the jobs in census tract 5046.02 are in the manufacturing, wholesale, and transportation employment sector. Table 3.17-6 compares total employment by industry for the Bay Area, County, and Alviso Census Tract area.

Table 3.17-6 Employment by Industry

	Bay Area		Santa Clara County		Tract 5046.02	
Industry	Jobs	Percent	Jobs	Percent	Jobs	% Percent
Agriculture, Forestry, Fishing and Hunting, and Mining	24,467	1%	4,500	0%	122	0%
Manufacturing, Wholesale, and Transportation Jobs	729,554	21%	276,451	31%	15,532	58%
Retail	364,864	10%	87,166	10%	1,504	6%
Financial and Professional Service Jobs	810,156	23%	176,948	20%	4,730	18%
Health, Educational, and Recreational Service Jobs	1,058,127	30%	241,836	27%	1,739	6%
Other Jobs	529,735	15%	116,940	13%	3,226	12%
Total	*3,516,903*	*100%*	*903,841*	*100%*	*26,853*	*100%*
Source: ABAG Projections, 2005.						

A goal of the San Jose 2020 General Plan is to promote the equitable distribution of Santa Clara County's solid waste disposal capacity among all jurisdictions within the County (Solid Waste Goals, 6). However, according to the California Integrated Waste Management Board, a total of three of the fourteen active county-wide solid waste disposal sites are located within the Alviso Census Tract area. This represents more than half of the solid waste facilities located in the City of San Jose (five). These solid waste facilities include the Zanker Material Processing Facility, the Zanker Rd. Class III Landfill, the Newby Island Compost Facility & BFI's Recyclery, and the Newby Island Sanitation Landfill. Additional Locally Unwanted Land Use (LULUs) facilities located within the Alviso Census Tract area include the San Jose/Santa Clara WPCP, Los Esteros Critical Energy Facility and Substation, and the Silicon Valley 230KV Switching Station. Table 3.17-7 summarizes the major facilities (solid waste, power, and water treatment facilities) located within the Alviso Census Tract area that are commonly described by planners and politicians as LULUs. Figure 3.17-1 illustrates the location of these facilities within the County of Santa Clara.

Table 3.17-7 Locally Unwanted Land Use Facilities Located within the Alviso Census Tract Area

Locally Unwanted Land Use (LULU) Facility	Facility Type	Location
City of San Jose/Santa Clara Water Pollution Control Plant	Water and Wastewater Plant	700 Los Esteros Rd.
Newby Island Compost Facility & BFI's Recyclery	Solid Waste Facility	1601 Dixon Landing Rd.
Los Esteros Critical Energy Facility and Substation	Power Plant Facility	800 Thomas Foon Chew Way
San Jose/Santa Clara Water Pollution Control Plant	Water and Wastewater Plant	700 Los Esteros Rd.
Silicon Valley 230KV Switching Station	Power Plant Facility	located immediately north of the existing LECEF power plant substation
Zanker Material Processing Facility	Solid Waste Facility	675 Los Esteros Rd.
Zanker Rd. Class III Landfill	Solid Waste Facility	705 Los Esteros Rd.

Note: This table is intended to summarize major infrastructure projects that are often considered Locally Unwanted Land Uses (LULUs). It is not a complete list of all infrastructure projects in the area.
Source: City of San Jose, Environmental Services, 2007; California Energy Commission, 2007; California Integrated Waste Management Board, Active and Permitted Facilities, 2007.

These land uses have come about in Alviso over many years and are the result of city, county, and state planning/permitting efforts.

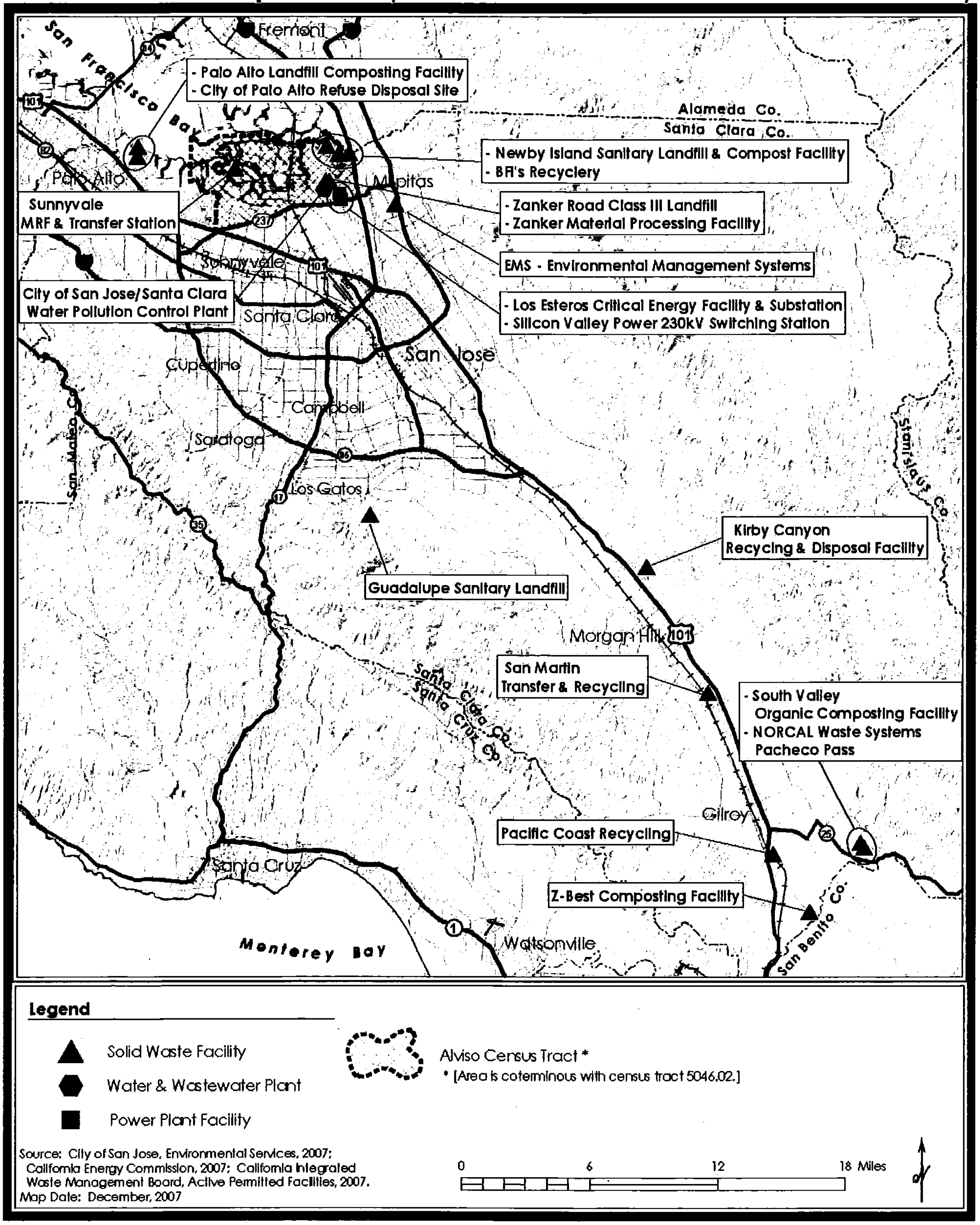
It is not uncommon for communities in or near urban centers to have one or more potential or actual hazardous materials sites. In addition to the major facilities identified in Table 3.17-7, there are seven sites in the Project area identified as potential sources or hazardous materials (see Section 3.7 for more detail):

- South Bay Yacht Club releases;
- Path leading from the District flood protection levee, onto the Project site for approximately 200 feet, and back to the levee;
- Former Bayside Cannery located on the eastern (opposite) side of the District flood control levee from the Project site;
- District's Pond A8 overflow weir area located west of the western bank portion of the Project site;
- Marshland Disposal Facility;
- South Bay Asbestos Area (SBAA); and
- Sediment deposits in Alviso Slough.

The Project site is partially located in the regional SBAA (EarthTech 2006). The SBAA is approximately 550 acres in size and encompasses much of the community of Alviso. It also includes the Santos Landfill and the Highway 237 Landfill (also known as the Marshland Landfill), and Sainte Claire Corporation landfills that received asbestos wastes from 1953 to 1982 (Kleinfelder 2006). Between 1986 and 1993, the

Alviso Slough Restoration Project

Figure 3.17-1: Locally Unwanted Land Use Facilities Located within Santa Clara County


San Francisco Bay
Fremont
Palo Alto Landfill Composting Facility
City of Palo Alto Refuse Disposal Site
Alameda Co.
Santa Clara Co.
Newby Island Sanitary Landfill & Compost Facility
BFI's Recyclery
Palo Alto
Milpitas
Sunnyvale MRF & Transfer Station
Zanker Road Class III Landfill
Zanker Material Processing Facility
Sunnyvale
EMS - Environmental Management Systems
City of San Jose/Santa Clara Water Pollution Control Plant
Los Esteros Critical Energy Facility & Substation
Silicon Valley Power 230kV Switching Station
Santa Clara
San Jose
Cupertino
Campbell
Saratoga
San Mateo Co.
Los Gatos
Stanislaus Co.
Kirby Canyon Recycling & Disposal Facility
Guadalupe Sanitary Landfill
Morgan Hill
San Martin Transfer & Recycling
Santa Clara Co.
Santa Cruz Co.
South Valley Organic Composting Facility
NORCAL Waste Systems Pacheco Pass
Gilroy
Pacific Coast Recycling
Santa Cruz
Z-Best Composting Facility
Monterey Bay
Watsonville
San Benito Co.
84
101
82
237
17
85
35
1
25
Legend
Solid Waste Facility
Water & Wastewater Plant
Power Plant Facility
Alviso Census Tract *
* [Area is coterminous with census tract 5046.02.]
0
6
12
18 Miles

Source: City of San Jose, Environmental Services, 2007; California Energy Commission, 2007; California Integrated Waste Management Board, Active Permitted Facilities, 2007.
Map Date: December, 2007

EPA paved areas where asbestos-contaminated surface soils in truck and industrial yards, wet-swept Alviso streets on a monthly basis, removed asbestos debris, installed landfill covers, implemented deed restrictions, and maintained and monitored the SBAA (Kleinfelder 2006). Their 1994 ambient air study of asbestos to assess the effectiveness of these clean-up efforts showed that there was no significant adverse health threat to the residents of Alviso due to asbestos fibers in the air (Kleinfelder 2006).

3.17.3 Project Economics

Under any of the action Alternatives, improvements to Alviso Slough would generate marginal economic benefits to local Alviso business owners and residents. The local economic benefits would primarily be realized by the SBYC and local retail establishments. Based on a map search of local retail establishments, there are four eating and drinking establishments and two convenience stores in Alviso. These establishments depend on local residents, workers, and, to a small extent, visitors.

Boating Expenditures

If the Project were approved, the SBYC could expect increased revenue generated from more boat capacity and usage as a fully serviceable marina. Still, larger boats that require depths of over eight feet or more would be unlikely to lease space at the SBYC because the marina would continue to provide only limited depth access to the greater San Francisco Bay under any of the restoration alternatives. Nonetheless, Alviso would likely experience an increase in boating visitors from the increased number of boat trips.

The CDBW found approximately 27 percent of boaters frequent a waterway because it is close to home (California Department of Boating and Waterways 2002). Thus, a serviceable marina and launching facility combined with waterway improvements could result in more South Bay boat owners launching from Alviso who would have traveled further to launch their boat. As referenced earlier in this section, the typical California boater spends approximately $45 per day on eating and drinking establishments and convenience and grocery goods. If, for example, boat visits increased by 1,000 boat visits a year and Alviso were able to capture half of the typical boater eating, drinking, convenience, and grocery expenditures, Alviso retail business revenues could increase by as much as $22,500 per year. Thus, to the extent boating trips increase in the Slough, Alviso's retail establishments could experience a marginal increase in business activity with approval of the Project.

Short Term Construction Related Expenditures

Beyond increased retail sales from more boaters accessing the Slough, Alviso could expect an increase in worker expenditures at local eating and drinking establishments and convenience goods establishments due to an increase in the daytime population during the construction phase of the Slough restoration. The actual extent of increased spending at local establishments would depend on the number of workers restoring the Slough and transporting sediment and vegetation, less the decrease in visitors that would have accessed the Slough but were discouraged by the restoration work.

During the restoration phase, there is an estimated daytime increase of as little as 10 workers in the area for less than 10 days (Alternative 1) to as much as 20 workers for as long as 30 weeks (Alternative 5). In addition, transporting of sediment and vegetation would require as little as 10 drivers for nine days (Alternative 1) to as much as 15 drivers for 220 days over 2 to 3 years. Alternative 1 requires the shortest restoration process and would generate less than $1,000 in Alviso retail expenditures, during the restoration and transport phases. Alternative 5 has the longest restoration process and would generate up to approximately $50,000 in Alviso retail expenditures per year during the restoration and transport phases. This assumes Alviso establishments would not lose any visitors during the restoration and transport phase.

Employment opportunities from restoration work at Alviso was evaluated for this EIR. Based on a survey of firms in the Bay Area capable of performing vegetation removal, the vast majority of the work would originate from firms located outside of Alviso and Santa Clara County. Based on a search of dredging and vegetation removal companies, there are approximately five firms in the Bay Area actively performing similar restoration work else where. Three of the firms are located in Contra Costa County, one is located in San Joaquin County, and the other is in Marin County. Thus, while restoration work may inject local day time retail expenditures from on-site workers frequenting local establishments, the majority of the construction expenditures are likely to flow to contractors outside of Santa Clara County.

3.17.4 Environmental Impacts and Mitigation Measures

Overview

As shown in Table 3.17-7 and Figure 3.17-1, there is a high proportion of the existing infrastructure that serves all of the greater City of San Jose and Santa Clara County and the State of California that may be considered by some residents as undesired projects, actions or facilities, that could be sources of pollution and may have been unwanted by more economically thriving communities within the City and County of Santa Clara.

Typical concerns include exposures, public health or environmental effects from the combined emissions and discharges, in a geographic area, including environmental pollution from all sources, whether single or multi-media, routinely, accidentally, or otherwise released. Impacts generally take into account sensitive populations and socio-economic factors, where applicable and to the extent data are available.

Examples of such public projects located in Alviso in the past approved by the City, County, State and Federal governments include landfills, dumps (including asbestos) and recycling facilities, power stations, and wastewater facilities as well as past Army Corps of Engineers Activities in 1960's with levee work concentrated within Alviso. The Alviso community history points to environmental justice issues as indicated above under Impacts SOCIOEC-2, 3, and 4, with these past City, County and State and Federal projects. This EIR does not provide analysis of past Environmental Justice issues, beyond observations as noted.

The current project may serve to provide positive economic input via construction dollars to the local economy and facilitate other private economic activity within the community via improved navigation and recreation opportunities within Alviso as well as act synergistically with the South Bay Salt Pond Restoration Project.

Significance Criteria

For the purposes the EIR, the Project would have a significant social or economic impact if it would result in the following:

- Displace, relocate, or increase area businesses associated with the expected increase in recreational users;
- Change lifestyles and social interactions;
- Change the ethnic or racial composition in the community;
- Change local employment opportunities and community tax base; or
- Disproportionately affect minority communities or low-income communities.

The significance criteria identified above are established based on EO 12898 and the Environmental Impact Checklist for Some of the More Common Social Concerns in the USFWS Reference Handbook. Because CEQA does not identify social and economic effects as significant, National Environmental Policy Act (NEPA) regulations were used to determine potential effects.

Impacts Evaluation

The impacts analysis in this ~~Draft~~ Final EIR evaluates five action alternatives and the required No Project alternative. The action alternatives include vegetation removal and/or dredging, as described in Chapter 2. Under the No Project alternative, the District would not take any action in the Project area and existing programs would continue. The analysis covers impacts from the construction, transportation of vegetation and sediment, and maintenance phases– both in the slough and at staging areas.

All of the action alternatives include the removal of navigational hazards from the Project area, including abandoned vessels, unused docks, and sunken vessels or debris, if not already resolved by BCDC, CSLC, the District, or SBYC by the time of commencement of construction of this Project. If active piers or docks are damaged or displaced in the process of vegetation and root mass removal, they would be re-installed after completion of work.

Table 3.17-8, below, lists each impact identified for the proposed alternatives, along with the significance of each impact. Impacts are classified as Class I (significant, cannot be mitigated to a level that is less

Table 3.17-8 Impact and Mitigation Summary

Impact	Impact Significance	Mitigation Measures
Impact SOCIOEC-1: Displace, relocate, or increase area businesses associated with restoration activities and the expected increase in recreational users.	Alts. 1-2: No impact	--
	Alts. 3-5: Class IV	--
	Alt. 6: No impact	
Impact SOCIOEC -2: Change lifestyles and social interactions.	Alts. 1-5: Class IV	--
	Alt. 6: No Impact	
Impact SOCIOEC -3: Effects disproportionately placed on minority and low-income communities or effects on the ethnic or racial composition in a community.	Alts. 1-6: No Impact	--
Impact SOCIOEC -4: Change employment opportunities and community tax base.	Alts. 1-6: No Impact	--
Note: The impacts and mitigation would be the same both with and without the SBSP Restoration Project.		

than significant), Class II (significant, can be mitigated to a level that is less than significant), Class III (less than significant and does not require mitigation), or Class IV (beneficial). Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections.

Impact SOCIOEC-1: **Displace, relocate, or increase area businesses associated with restoration activities and the expected increase in recreational users.**

Overview

None of the current project alternatives being considered as part of the Alviso Slough Restoration Project would require local business or resident relocation, as restoration work would be isolated to the Slough and the staging areas. The staging areas would include a combination of several sites located adjacent to or near the Slough (see Figures 2-7 and 2-8 in Chapter 2) and would only disrupt businesses by the increased number of truck trips hauling sediment and vegetation from the Slough to nearby disposal facilities. Further, the proposed truck routes would minimize impacts to Alviso residents and businesses.

Alternatives 1 and 2

Alviso retail establishments could experience a slight increase in business activity due to an increase in the daytime population from Slough restoration and transport workers and subsequent increase in boating activity at the Alviso Slough. The increased business activity is projected to be small for Alternatives 1 and 2 because depths would limit the type of boats that can navigate the waterway and the construction period would be relatively short. Due to the shorter construction timeframes and smaller impact on the Slough with respect to recreation, this is considered **No Impact** for Alternatives 1 and 2.

Alternatives 3, 4, and 5

Alternatives 3, 4, and 5 would have a more prominent impact on waterway depth, would require significantly longer restoration and transport periods, and would require significant maintenance to maintain the waterway depths. The difference in construction and transportation periods from Alternative 1 to Alternative 3 is 67 days (i.e., Alternative 1 requires approximately 19 days and Alternative 3 requires approximately 86 days). Alternatives 3, 4, and 5 would also require larger work crews, providing a more significant positive economic impact on surrounding businesses. Still, the estimated increase in local retail sales from Slough restoration and transport work is less than $50,000 per year. Albeit relatively small, this is considered a **Beneficial Impact** under Alternatives 3, 4, and 5.

Alternative 6: No Project

As the No Project alternative, Alternative 6 would have **No Impact** on area businesses and current conditions would prevail.

Impact SOCIOEC -2: **Change lifestyles and social interactions.**

Overview

Improvements to Alviso Slough would increase available boat recreation opportunities for Alviso residents and visitors accessing the waterway.

Alternatives 1, 2, 3, 4, and 5

Under any of the restoration alternatives, Alviso residents would enjoy improved boat accessed either by launching from the proposed Alviso Marina County Park boat launch or from the South Bay Yacht Club. While increased water recreation opportunities can be enjoyed by the larger region, Alviso residents specifically would have immediate access to the improved waterway. This is considered a **Beneficial Impact.**

Alternative 6: No Project

As the No Project alternative, Alternative 6 would have **No Impact** on lifestyles and social interactions and current conditions would continue.

Impact SOCIOEC-3: **Effects disproportionately placed on minority and low-income communities or effects on the ethnic or racial composition in a community.**

Overview

As discussed earlier in this chapter, Alviso is a concentrated low- and moderate-income area as defined by HUD. Therefore, it is important to determine if this community would sustain a disproportionate adverse impact as a result of this Project. Adverse impacts to the Alviso community include impacts associated with pre-construction, construction, and maintenance activities as identified in the preceding resource topic discussions in Chapter 3 of this EIR. Adverse impacts are mostly limited to temporary, construction-related impacts such as temporary increases in noise and traffic.

Over time under the restoration alternatives (Alternatives 1 - 5), Alviso residents would gain better boat access to an adjacent waterway. Thus, to the extent that local residents are able to own or rent boats, residents would enjoy a larger and more navigable waterway. In addition, the restoration alternatives could generate marginal increases in local business activity from restoration worker and boat visitor spending. The expected increase in local retail sales are relatively small and indicate no significant positive impact to Alviso neither contributing to, nor negatively impacting, local residents. Overall, the positive impacts from enhanced boat recreation are relatively small with no significant local community benefit.

Alternatives 1, 2, 3, 4, and 5

All action Alternatives would result in adverse impacts that would be borne by the community of Alviso. However, the impacts are generally temporary in nature, only occurring during the construction / maintenance phase (e.g., truck traffic, noise, etc.). Furthermore, the initial planning phases of this Project have been completed in alignment with the ALGC, whose members are strong supporters of a major action in Alviso Slough to accomplish the Project Objectives as stated in Chapter 1. For these reasons, the Project would not result in an adverse Environmental Justice impact to minority and low-income communities. This is considered **No Impact**.

Alternative 6: No Project

The No Project alternative would continue existing conditions, neither improving nor adversely impacting Alviso as a result of this Project alone. This is considered **No Impact.**

Impact SOCIOEC-4: **Change employment opportunities and community tax base.**

Overview

As discussed in the Project Economics section, none of the alternatives generate significant economic benefits to Alviso residents. The vast majority of the restoration work is expected to come from specialty contractors who are not based in Santa Clara County. Rather, Alviso Slough restoration dollars would flow to other Counties where these contractors are based.

Alternatives 1, 2, 3, 4, and 5

Under the most intensive alternative, Alternative 5, Alviso could expect up to $100,000 per year (as a best case scenario) in additional retail expenditures during the restoration and transport phases over two years. Alviso businesses could also expect an increase in boater spending to the extent an increase in navigable waterway creates additional boat visits. Still, under this best case scenario, Alviso would experience only a marginal increase in total employment estimated at up to five new jobs, which is less than a 0.1 percent increase in total employment. This impact is considered neither adverse nor beneficial, and is therefore qualified as **No Impact** under all alternatives.

Alternative 6: No Project

The No Project alternative would continue existing conditions, neither improving nor adversely impacting Alviso. This is considered **No Impact**.

3.17.5 Relationship to South Bay Salt Ponds Phase 1 Action at Pond A8

The impacts identified above would be the same with or without the Phase 1 Action at Pond A8.

3.17.6 Sediment Disposal Options

Sediment disposal options include trucking or barging the dredged sediment to a location where it could be re-used or disposed, rather than trucking the material to the Newby Island landfill, as described in Chapter 2. These disposal options would result in similar impacts as considered above. Another option is the use of a slurry pipeline to move dredged sediment from the Project area to a nearby restoration site such as Pond A8 or Pond A4 (if these are determined to be acceptable). The use of a slurry pipeline would greatly reduce the number of truck trips and thereby workers required by the Project. Hauling and disposal costs are a major portion of the total Project cost. If any of the disposal options are selected and are determined to result in a significance change in the estimated cost, a cost-benefit analysis would need to be performed to determine actual impacts to the local economy.

This page intentionally left blank.

4. Growth Inducement and Cumulative Analysis

This chapter includes an analysis of growth inducing impacts and cumulative impacts that would result from the implementation of the Project with other past, present or future probable projects.

4.1 GROWTH INDUCING IMPACTS

Section 15126.2(d) of the CEQA Guidelines requires that an Environmental Impact Report (EIR) address the potential growth inducing impacts of a proposed project. Specifically, the EIR shall "discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing either directly or indirectly, in a surrounding environment." Projects which could remove obstacles to population growth must also be considered in this discussion.

Section 3.17, Social and Economic Resources, Including Environmental Justice, describes the existing population, housing, and employment for Santa Clara County, City of San Jose, and the Alviso census tract encompassing the Project area based on the Association of Bay Area Governments (ABAG) data. The past and projected total population and households in Santa Clara County and the City of San Jose based on the Department of Finance and the Santa Clara County Planning Office are shown in Tables 4-1 and 4-2 below.

Santa Clara County and the City of San Jose have experienced an increase in population from 1990 to present day 2007 and have grown by 20.7 and 24.5 percent respectively. Population projections indicate continued growth in the Bay Area. Between 2000 and 2020, the County and City's population is projected to grow by 23 and 34 percent respectively.

The total number of housing units has increased by approximately 14.2 and 17.5 percent since 1990 for the County and City respectively. A high vacancy percentage indicates a low demand for housing while a low percentage indicates a high demand for housing. The census data shows that the number of housing units have increased steadily while the vacancy rate has decreased since 1990, indicating that there is a demand for housing in both the County and City.

Table 4-1 Regional Population Trend and Projections 2007 – 2020

Area	1990[1]	2000[1]	2006[2]	2007[2]	2010[3]	2015[3]	2020[3]
Santa Clara County	1,497,577	1,682,585	1,780,449	1,808,056	1,855,500	1,959,100	2,073,300
City of San Jose	782,224	894,943	957,915	973,672	1,049,800	1,118,800	1,196,900

Notes:
1. State of California, Department of Finance, *Revised Historical City, County and State Population Estimates, 1991-2000, with 1990 and 2000 Census Counts.* Sacramento, California, March 2002.
2. State of California, Department of Finance, E-1 Population Estimates for Cities, Counties and the State with Annual Percent Change — January 1, 2006 and 2007. Sacramento, California, May 2007.
3. Santa Clara County Planning Office, Conditions and Trends in Santa Clara County, Santa Clara, California, May 2005.

Table 4-2 Housing Units

	1990 Total Housing Units[1]	Percent Vacancy[1]	2000 Total Housing Units[2]	Percent Vacancy	2006 Estimate[2]	Percent Vacancy	2007 Estimate[2]	Percent Vacancy
Santa Clara County	540,240	3.71	579,329	2.32	612,129	2.30	617,175	2.29
City of San Jose	259,358	3.53	281,937	1.86	301,848	1.86	304,698	1.90

Notes:

1. State of California, Department of Finance, *City/County Population and Housing Estimates, 1991-2000, with 1990 Census Counts.* Sacramento, California, May 2000.
2. State of California, Department of Finance, *E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2007, with 2000 Benchmark. Sacramento, California, May 2007.*

The Alviso Slough Restoration Project would not displace any housing or people, as no residential uses occur at the Project area. As such, the Project would not necessitate the construction of replacement housing elsewhere. The Project does not propose construction of any housing, directly or indirectly, in the Project vicinity. Because the alternatives consist of vegetation removal and/or dredging, the proposed improvements would not induce or encourage additional population growth or development elsewhere, or remove obstacles to population growth.

Population and housing growth as anticipated by the Department of Finance and the Santa Clara County Planning Office would occur regardless of whether the Project is implemented. As such, the Alviso Slough Restoration Project would not result in direct growth or induce substantial growth in the region. Potential effects are considered less than significant.

4.2 INTRODUCTION TO CUMULATIVE IMPACTS

CEQA defines a cumulative impact as "an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts" (CEQA Guidelines, Section 15130[a][1]). The CEQA Guidelines require a discussion of cumulative impacts when the project's incremental effect is cumulatively considerable, as defined in Section 15065(a)(3).[1] This analysis conforms to Section 15130 of the Guidelines, which also includes the following:

(a) ...Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

(1) ...An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.

---

[1] "Cumulatively considerable" is defined as the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

(2) When the combined cumulative impact associated with the project's incremental effect and the effects of other projects is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed in further detail in the EIR. A lead agency shall identify facts and analysis supporting the lead agency's conclusion that the cumulative impact is less than significant.

(3) An EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus is not significant. A project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact. The lead agency shall identify facts and analysis supporting its conclusion that the contribution will be rendered less than cumulatively considerable.

The CEQA Guidelines identify two basic methods for establishing the cumulative environment in which the project is to be considered: either a list of past, present, and probable future projects producing related or cumulative impacts; or the use of adopted projections from a General Plan or other regional planning document (CEQA Guidelines, Section 15130[b][1]). This ~~Draft~~ Final EIR uses a list of projects compiled from local and regional agencies.

The CEQA Guidelines specifies when using a list to determine a related project, the factors to consider include the nature of each environmental resource being examined, the location of the project and the type.

4.2.1 Cumulative Setting

Overview

Local and regional related projects in the vicinity of the Alviso Slough Restoration Project are described below. These projects (hereafter referred to collectively as cumulative projects) were compiled based on information from local and regional agencies. Local projects are those located within the City of San Jose. Regional projects extend beyond city boundaries and may cover a larger Project area. Cumulative projects include those that have been implemented, that are being implemented, or that are reasonably expected to occur in the future within and around the project area. Relevant cumulative projects are those that would likely be constructed concurrently and within the same geographic scope as the proposed Alviso Slough Restoration project. Thus, the timing and proximity of cumulative projects are considered in determining cumulative impacts. As described in Chapter 1, Introduction, Purpose and Need, the Alviso Slough Restoration Project would be implemented on weekdays during the summer months (as allowable) in 2010 (and 2011 and 2012, as needed, depending on the Alternative selected), and repeated for maintenance approximately every three to five years until the SBSP Phase 1 Action at Pond A8 is fully implemented; such maintenance would have to be performed for up to 10 years, after which the scouring effects of the SBSP Phase 1 Action would sustain the removal of vegetation.

A list of the relevant cumulative projects located within the geographic context of the Alivso Slough Restoration Project and that could also occur concurrently with the Project are presented below. The types of projects that are evaluated in the cumulative context are those which would result in similar environmental effects.

Related Projects

South Bay Salt Ponds (SBSP) Restoration Project

The SBSP Restoration Project encompasses approximately 15,100 acres of former salt ponds located around the edge of South San Francisco Bay (South Bay), within three pond complexes, including the Alviso pond complex, which is immediately adjacent to the Alviso Slough Restoration Project area. The SBSP Restoration Project is intended to restore and enhance wetlands in South Bay while providing for flood management and wildlife-oriented public access and recreation.

A joint Public Draft Environmental Impact Statement / Report (EIS/R), prepared by the United States Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG), was published in March 2007. The EIS/R evaluated three long-term program alternatives, each of which represents a progression toward a different long-term end-state (different ratios of tidal habitat to managed pond habitat restoration). Besides the No Action Alternative, the other long-term alternatives would restore tidal/managed pond habitat, provide a cohesive line of flood protection along the perimeter of the SBSP Restoration Project area, and provide public access and recreation features in the form of trails and viewing platforms, interpretive stations, waterfowl hunting, access to and interpretation of cultural resource features, opportunities for education and interpretation, non-motorized boat launching points and associated staging and parking areas. Long-term alternatives would be implemented over a 50-year planning horizon. In addition to the long-term alternatives, the EIS/R evaluated the first phase of restoration (Phase 1 actions) that are common to the two long-term action alternatives. Phase 1 actions are expected to be constructed from 2008 to 2009. Subsequent phases of the SBSP Restoration Project have not been determined and would be guided by the Adaptive Management Plan proposed as part of the SBSP Restoration Project. Subsequent environmental review would be required for future phases of the SBSP Restoration Project.

Pond A8, located immediately adjacent to the Alviso Slough Restoration Project area, has been proposed as one of several locations for early implementation of the SBSP Restoration Project. While not yet approved and adopted, the SBSP Phase 1 Action at Pond A8 would restore reversible muted tidal exchange to create approximately 1,400 acres of shallow subtidal habitat in Ponds A8, A5 and A7. Restoration of tidal action at Pond A8 is designed to be reversible so that in the event that unacceptable ecological impacts begin to occur, tidal exchange between Pond A8 and Alviso Slough can be eliminated to prevent long-term adverse impacts. During Phase 1, water exchange would be limited and tidal range within the three ponds would be muted during the dry summer and fall months, and water level fluctuation in the ponds over a tidal cycle would be small (approximately 0.5 feet) compared to the range of tidal change in the slough (over 8 feet).

Over the long-term (10 years and beyond), future SBSP phases would increase the width of Alviso Slough channel if Pond A8 were restored to full tidal action. In the event that results from the ongoing South Baylands Mercury Project indicate that ecological risk associated with mercury toxicity in wildlife is unacceptable, Pond A8 may be managed as a non-tidal pond. Under this scenario, the notch may be closed and, thus, vegetation and sediment removal as a result of Pond A8-induced scour would not be sustained.

Recreation facilities are also proposed under Phase 1 of the SBSP Restoration Project. These include: 1) Pond A16 viewing platform; 2) Pond A16 interpretive station; and 3) Sunnyvale to Stevens Creek Bay Trail Spine, all located west of the Alviso Slough Restoration Project area.

Until the SBSP Restoration Project is approved, the Interim Stewardship Plan (ISP) would guide operations of the SBSP Restoration Project Area until long-term alternatives are completed. The ISP is intended to maintain and enhance the biological and physical conditions within the SBSP Restoration Project area during the interim period between the cessation of salt production and implementation of the SBSP Restoration Project. Ongoing management of the not-yet-restored ponds (including those in the vicinity of the Alviso Slough Restoration Project area) will be consistent with current O&M activities. Current O&M activities within the SBSP Restoration Project Area include the replacement and/or repairs of water control structures and maintenance of existing levees.

For the purposes of evaluation, only the action alternatives of the SBSP Restoration Project are included in the analysis of cumulative impacts. In addition, only activities within the Alviso pond complex (and not the other two pond complexes) are considered in the evaluation of cumulative impacts.

Santa Clara County - Alviso Marina County Park Improvement Project

The Santa Clara County Parks Department is currently planning an expansion of the existing Alviso Marina County Park, including a new boat-launching concrete ramp, docking facilities for small non-motorized watercraft such as kayak and canoes, and vehicle/trailer parking lot. The launch site is also identified as an access point in the 2007 Draft San Francisco Bay Area Water Trail Plan; an objective of the Water Trail is to link access points around the Bay. This project is located adjacent to Alviso Slough on a 1.8-acre parcel acquired by Santa Clara County from the federal government.

The design work, contract documents and permit issuance by the various regulatory agencies is underway by the County. The Santa Clara County Parks Department has applied for the necessary regulatory agency permits for construction of the boat launch and has submitted copies of the plans to the Santa Clara Valley Water District for needed encroachment permits. An addendum to the 1997 Final EIR was filed in January 2009 to review the environmental impacts and mitigations identified in the Final EIR and determine if other impacts may exist in light of current environmental and project conditions. The Addendum also identifies new impacts of the project that result from other new projects in the area, including the Alviso Slough Restoration Project. A public notice was issued on June 17, 2009 by the U.S. Army Corps of Engineers regarding the project application pursuant to the provisions of Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act of 1972. The exact start date for construction is unknown, but expansion is expected to occur in 2009, before construction of the Alviso Slough Restoration Project.

SFEI - South Baylands Mercury ~~Study~~Project

The South Baylands Mercury Project is an adaptive management study being conducted prior to initiating the SBSP Phase 1 Action. Under leadership from the San Francisco Estuary Institute (SFEI), the SFEI, U.S. Geological Survey (USGS), and the District are engaged in a scientific effort to develop indicators of mercury (Hg) problems, and to survey the magnitude and extent of the problem for South Baylands. The two-year project is currently underway. Future project components will expand these activities to encompass more of the South Baylands, among other actions. It is likely that the study would be completed prior to implementation of the Alviso Slough Restoration Project.

District - Stream Maintenance Program

The District's Stream Maintenance Program (SMP) allows the District to continue preserving the existing level of flood protection of approximately 240 miles of streams and water delivery function of approximately 29 miles of canals in the County. The SMP area covers streams, water delivery canals, and adjacent properties in Santa Clara County for which the District owns or holds an easement for access and maintenance. The SMP consists of major routine maintenance activities including the removal of sediment, removal of vegetation growth, and repair of erosion sites within and along streams and canals. Other minor routine activities include maintenance of vegetation sites, fence repair, trash removal, and removal of downed trees or other blockages from streams. Routine maintenance activities under the SMP is expected to preserve the flood protection for approximately 31,645 acres of residential, commercial, industrial, public, agricultural, and open space parcels in Santa Clara County. The SMP initiated in 2004. Maintenance activities are conducted at various locations during the summers of each year. As part of the SMP, the area upstream of the Alviso Slough Restoration Project area is maintained routinely once a year to once every two years; this activity lasts approximately two months.

Nearby Recreation Projects

A Recreation Technical Report, prepared for the District in 2007, was reviewed by the District's Independent Advisory Panel for recreational opportunities related to the project. The report identifies the plans and projects related to recreational uses in and around Alviso Slough. Recreation projects that qualify as probable projects and are expected to occur sometime in the future are presented in Table 4-3 below. However, the timing of activities is not always known.

City of San Jose - Development Projects

The City of San Jose Development Activity Highlights and Five-Year Forecast (2007-2012) provides an assessment of development activity in San Jose since 2003 as well as a five-year projection of development projects. San Jose is divided into 15 planning areas. The Alviso planning area includes all properties within the City of San Jose north of SR 237, between Coyote Creek and Guadalupe River; it encompasses the community of Alviso and the Alviso Slough Restoration Project area. The North planning area is located south of the community of Alviso; it is bounded by SR 237 to the north, the City of Santa Clara/San Jose city boundary to the west, the City of Milpitas/San Jose city boundary and I-880 to the east, and I-880 to the south. Table 4-4 shows the major development projects[2] in the two planning areas proximate to the Alviso Slough Restoration Project, their types/sizes, and status. As shown in Table 4-4, there are only two projects located within the Alviso planning areas. Numerous projects are located within the North planning area, but only those within approximately two miles of the community of Alviso (generally north of Montague Expressway) are presented in Table 4-4.

---

[2] Major projects are defined as residential projects greater than 50 dwelling units, commercial projects greater than 25,000 square feet, and industrial projects greater than 75,000 square feet. This data collection effort has identified approximately 35,000 dwelling units and 16 million square feet of nonresidential space submitted for Planning approval since January 1, 2003.

Lower Guadalupe River Flood Protection Project

The intent of Lower Guadalupe River Flood Protection Project (LGRP) was to improve the channels to convey storm water runoff from up to a one percent (100 year) flood event, protect endangered species, preserve fish and migratory bird habitat, and allow for open-space recreation.

The District made flood protection improvements and conducted mitigation planting along 6.5 miles of the Guadalupe River from the I-880 bridge north to the County Marina. Project work included: construction of floodwalls or raising levees along the river banks; replacement of the SR 237 eastbound bridge; modification of 19 storm drain outfalls; improvement and construction of maintenance roads and undercrossings; construction of an overflow weir to divert high flows into one of the salt ponds; improvement of the west perimeter levee around Alviso, and construction of grade-control weirs (gradual drops in the stream elevation). The project also featured enhancements, which included providing maintenance roads suitable for use as recreational trails.

Long-term operation and maintenance elements of this project include management of vegetation and sediment from below the UPRR bridge to SR 237; use of temporary pumps in the salt ponds after major storms to restore capacity following large flow events; and planting of native vegetation. The District began construction in early April 2003 on the LGRP. The construction of flood protection improvements were substantially completed in 2005.

South San Francisco Bay Shoreline Study

The South San Francisco Bay Shoreline Study was originally authorized by Congress in 1976 to assess the need for flood protection in the South Bay. The Shoreline Study area extends along South San Francisco Bay including the shoreline and floodplain areas in the counties of Alameda, San Mateo, and Santa Clara. In July 2002, the U.S. House of Representatives requested that the U.S. Army Corps of Engineers (USACE) review its previous study on flood control in the South Bay, expanding the scope to include environmental restoration and protection, as well as tidal and fluvial flood damage reduction and related purposes.

On October 24, 2005, USFWS, the USACE, the District, and the Coastal Conservancy began the first stage of the Shoreline Study – the Alviso Ponds and Santa Clara County Interim Feasibility Study; this feasibility study includes the Alviso Slough Restoration Project area. Alternatives are currently being developed for the first stage of the Shoreline Study. Potential actions include flood protection improvements, ecosystem restoration, and recreation and public access features. The USACE has not identified where any of the preliminary actions presented above would occur, nor has it committed to implementing any Shoreline Study actions at this time. Shoreline Study alternatives will be determined through the USACE's plan formulation process as part of future Interim Feasibility Studies. The preliminary list of potential actions will be evaluated in separate, subsequent project-level EIS/Rs as part of the Interim Feasibility Studies.

Port of Alviso with Navigation Channel/Emergency Access

In early 2009, the San Jose Silicon Valley Chamber of Commerce (Chamber) and the Santa Clara Valley Water District (District), put forth a funding request to the U. S. Economic Development Administration (EDA) to develop a plan to create a port in the Alviso area of the City of San José. Development of a port would have two important objectives with local and regional impacts, according to the application submitted:

1) Economic Development: The development of a port with a navigation channel in the Alviso area of the South San Francisco Bay would create more open water, enhance the natural aesthetics, improve navigation capabilities, and enhance the potential for new economic development opportunities. These opportunities could include the development of a glass pavilion with a mix of retail shops and restaurants along a promenade, and an adjacent hotel, with open space areas for a park to improve recreational access from the shoreline. It could also allow subsequent development of a museum, concert facility, IMAX® theater, amusement park, and other shore-related recreational facilities. The overall goal is to allow the community of Alviso to return the slough to the historic advantages of an operating port and its accompanying economic and community benefits. With the accomplishment of this objective, significant new employment and revenue will be generated upon completion of the development phase.

2) Emergency Access: The major regional benefit of the proposed navigation channel is that it would provide emergency access routes out of the South San Francisco Bay Area during catastrophic events such as earthquakes or other natural or man-made disasters. In the event of an earthquake or other disaster, damage to the region's surface transportation network would be extensive and would cripple the local economy. In fact, a Bay Area Association of Governments Study shows that over 1,700 roads would likely be closed, resulting in the closure of all trans-bay bridges and the Bay Area Rapid Transit System, making it difficult, if not impossible, for the continued movement of goods and commerce and emergency supplies in and out of the South Bay communities. Fulfillment of this objective will have a significant job and revenue potential to the entire Silicon Valley and its residents, in the event of an emergency, by maintaining traffic flow between Silicon Valley and San Francisco and the overall Bay area.

Table 4-3 Cumulative Recreation Projects

Agency and Plan	Known Future Projects in Alviso
City of San Jose: Alviso Master Plan	*Historic Bayside Cannery* Refuge clean-up projects in 2002 included an environmental site assessment at the Alviso Cannery on Don Edwards San Francisco Bay National Wildlife Refuge that will allow for 'disposal' (land exchange) of the cannery parcel in exchange for wildlife habitat[3] *Blue Whale Sailing School* The owner of the Blue Whale Sailing School has posted information at the site describing plans to build new facilities on the slough. However, the owner will need permits to build from the Bay Conservation and Development Commission (BCDC), which is unlikely to issue building permits in a highly flood-prone area.
City of San Jose: Bay Trails Master Plan	The Master Plan includes a 13-mile trail system (divided into 9 reaches) with a trail along the north-easterly bank from Gold Street to the Alviso Marina, and a trail along the perimeter of the Legacy Development site using an existing maintenance road that follows the south-westerly bank. *Bay Trail Reach 7A – Levee Trail from County Marina to Union Pacific Railroad* A Joint-trail Agreement was executed with the District and work orders for signage and fencing have been submitted to the District for permitting. Completion of the Agreement and word orders will allow for improved City-District coordination and installation of improvements beyond what is existing at the site. *Bay Trail Reach 9B - Bicycle/pedestrian bridge* In March 2006, the City of San Jose completed the first phase of a feasibility study for a 540-foot bicycle/pedestrian bridge needed to ensure a continuous Bay Trail path in Alviso. As currently planned, the proposed Bay Trail would cross an active railway which presents many technical and safety challenges. The development of this bridge would allow Alviso Slough crossing, future trail connection to the Sunnyvale Baylands, and access to the levee trails at Alviso Marina County Park. Phase II of the feasibility study is funded with a $95,000 Bay Trail grant and will include collection of topographical data, geotechnical analysis, and the preparation of an initial environmental assessment. Work on Phase II was completed by Fall 2007 during which the City will continue to seek construction funds for this project. *Lower Guadalupe River Trail - Gold Street/Alviso to I-880 (~6.4 miles)* A Joint-Trail Agreement was executed with the District and work orders for signage, call boxes and fencing modifications have been submitted to the District for permitting. Funds are expected to be available in Federal fiscal year 2008 to complete segments of the trail from I-880 to Gold Street upon the north easterly bank levee;

---

[3] USFSW web site: www.fws.gov/pacific/ecoservices/envicon/pim/refugecleanup.htm and Personal Communication (E. Rank with C. Morris 1/3/07)

Table 4-3 Cumulative Recreation Projects

Agency and Plan	Known Future Projects in Alviso
	the improvements will be constructed only after construction is complete at SR 237.
Santa Clara County: Trails Master Plan	*New trails* San Francisco Bay Trail (#R-4) is identified as a priority trail. Lead agencies would be the City of San Jose, and USFWS.
Santa Clara Valley Water District: Clean, Safe Creeks and Natural Flood Protection Program	*Grant Application for Trail Improvements* High priority trail projects selected for complete or partial grant funding are linked to Alviso area trails discussed above, particularly along segments of Coyote Creek, Calabazas Creek, and San Tomas Aquino Creek. The City of San Jose is planning to implement trail improvements and a pedestrian bridge over Alviso Slough near the Union Pacific Railroad bridge in Alviso (Bay Trail reach 7A) at some time in the future.
ABAG Bay Trail Plan	*Planned trail projects around Alviso:* Short term (1-5 years) planned projects: ▪ Los Esteros Road from Spreckles Avenue to Zanker Road ▪ Spreckles between Los Esteros Road and State Street ▪ Zanker Road to Coyote Creek ▪ Gold Street between Alviso Marina County Park and State Street Mid term (6-10 years) planned projects: ▪ Alviso/San Jose; Pond A-18 ▪ Shoreline alignment north of State Street., from Catherine Street to Spreckles Avenue ▪ Zanker Road between SR 237 trail ▪ State Street between Gold and Spreckles ▪ Between SR 237 to intersection of Gold and Taylor Streets ▪ Gold Street between SR 237 pathway and State Street Long term (10-15 years) planned projects: ▪ Between Sunnyvale trail and Gold Street Bridge
USFWS: Don Edwards San Francisco Bay National Wildlife Refuge	*Don Edwards San Francisco Bay National Wildlife Refuge Hunt Plan Amendment* Under the Plan, Pond A8N is open to waterfowl hunting three days a week. A Refuge Special Use Permit is required for hunting of these ponds as well as use of small private boats on the ponds. The Gold Street gate would be opened one hour before the start of shoot time and closed one hour after end of shoot time. Parking is at the designated parking lot and along Gold Street. Hunters are able to hunt from the levees and use small private boats to reach blinds in the ponds. These private boats will be placed in the ponds before the hunting season, left in the ponds during the season and removed after the hunting season. The boats must be either non motorized or electric motors. The blinds can be maintained by private parties with Refuge Special Use Permits but must be open to all hunters on a first come, first use basis.

Table 4-4 List of Cumulative Major Development Projects in San Jose (North and Alviso Planning Areas)

Project	Location	Project Type / Unit / Size	Status	Planning Area	Relationship to the project
Major Residential Projects					
The Sycamore at North Park Apts	W/s Zanker, 1000' sly Tasman	MF (445 units)	Under Construction	North	South of SR 237
North Park Apts	E/s N. 1st bet River Oaks & Baypointe	MF (637 units)	Approved Projects (Construction Not Yet Commenced)	North	South of SR 237
Sony Mixed Use	SE/c Zanker & River Oaks	SF (1,900 units)	Projects Pending City Approval	North	South of SR 237
Vista Montana Park	B/s Vista Montana, bet Tasman & N. 1st	SF (969 units)	Projects Pending City Approval	North	South of SR 237
Seeley Housing	SE/c River Oaks & Seeley	SF (880 units)	Projects Pending City Approval	North	South of SR 237
Zanker Condos	NW/c Zanker & Tasman	SF/MF (670 units)	Projects Pending City Approval	North	South of SR 237
Baypointe Mixed Use	NE/c Baypointe & Tasman	MF (636 units)	Projects Pending City Approval	North	South of SR 237
Hyundai Site Housing	N/s Montague, 550' wly N. 1st	SF (608 units)	Projects Pending City Approval	North	South of SR 237
Sonora Townhomes	NE/c Sonora & Hwy 87	SF (302 units)	Projects Pending City Approval	North	South of SR 237
Renaissance Housing	SW/c Renaissance & Vista Montana	SF (263 units)	Projects Pending City Approval	North	South of SR 237
Baypointe Housing	W/s Baypointe, 370' nly Tasman	SF (183 units)	Projects Pending City Approval	North	South of SR 237
Major Commercial Projects					
Gold Street Office	SW/c Gold & Guadalupe River	24,000 square feet	Under Construction	Alviso	South of the Project area
Alviso Youth Foundation	W/s Gold term El Dorado	88,000 sq. ft.	Approved Projects (Construction Not Yet Commenced)	Alviso	South of the Project area
Major Industrial Projects					
eBay (Building 17)	SW/c N. 1st & Charcot	187,000 sq. ft.	Under Construction	North	South of SR 237

Notes SF = Single Family; MF = Multi-Family

4.2.2 Cumulative Impacts

Overview

This section contains a discussion of potential cumulative effects resulting from implementation of the proposed project together with other cumulative projects described above, and specifically the Alviso Slough Restoration Project's contribution to those effects. Cumulative impacts could occur if cumulative project were constructed concurrently and in the same geographic context as the proposed project.

The majority of the impacts expected from the cumulative projects would be primarily construction in nature and thus would be temporary (e.g., construction of recreational facilities and development projects). However, operation impacts may also occur for some of the cumulative projects (e.g., development projects would generate long-term increases in traffic and air quality emissions). In other cases, specifically the South Baylands Mercury Study, minimal impacts are expected due to the nature of the project (e.g., consisting of mostly data collection).

Although some of the cumulative projects would be implemented prior to the start of the Alviso Slough Restoration Project, the precise timing of other cumulative projects (e.g., future phases of the SBSP Restoration Project, Shoreline Study potential actions), is not known. For the purposes of this assessment, they are assumed to occur simultaneously with the Alviso Slough Restoration Project. This approach could overestimate potential effects because it is unrealistic to assume all cumulative projects that have not yet occurred would be constructed simultaneously; however, it is a conservative approach. Table 4-5 shows the environmental resources that would likely be affected if the cumulative projects identified above (excluding the proposed project) were implemented individually. In most cases, these impacts would result from construction activities. When viewed collectively, the table also depicts the cumulative impacts that would likely be a concern.

Table 4-5 Cumulative Projects in the Vicinity of Alviso Slough Restoration Project

Project Name	Potential Effects from Construction / Operation on Resources[1]					
	Hydrology / Water Quality	Biological Resources	Air Quality	Recreation	Traffic	Noise
SBSP Restoration Project	√	--[3]	√	√	√	√
Santa Clara County - Alviso Marina County Park Improvement Project	√	√	√	√	√	√
SFEI - South Baylands Mercury Study[2]	--	--	--	--	--	--
District - Stream Maintenance Program	√	√	√	√	√	√
Nearby Recreation Projects	√	√	√	√	√	√
City of San Jose – Development Projects	√	√	√	√	√	√

Table 4-5 Cumulative Projects in the Vicinity of Alviso Slough Restoration Project

Project Name	Potential Effects from Construction / Operation on Resources[1]					
	Hydrology / Water Quality	Biological Resources	Air Quality	Recreation	Traffic	Noise
Lower Guadalupe River Flood Protection Project	√	√	√	√	√	√
South San Francisco Bay Shoreline Study	√	√	√	√	√	√
Port of Alviso	- √	√	√	√	√	√

Notes:

1 Determination of potential effects on identified resources is based either on environmental assessments prepared for the cumulative project or a conservative assessment of typical effects associated with construction/operation of individual cumulative projects. In the absence of field reconnaissance and environmental documents conducted for these cumulative projects, a cursory analysis has been provided here for the purposes of evaluating cumulative impacts only. The occurrence of potential effects for the above categories may differ once detailed environmental analysis is conducted for each cumulative project. Potential effects are assessed before mitigation measures are applied. A check indicates potentially significant impacts prior to implementation of mitigation measures.

2 Biological resources effects under the SBSP Restoration Project are expected to be less than significant with the implementation of the Adaptive Management Plan that is an integral part of the project.

3 '--' indicates Not Applicable

In accordance with CEQA Guidelines Section 15130(b), the cumulative analysis first establishes the geographic scope of the area affected by the cumulative effect[4]. Next, a summary of the expected environmental effects to be produced by those projects and a reasonable analysis of the cumulative impacts of the relevant projects are presented. The discussion would examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects. The project's impacts are then discussed, with an emphasis on whether they would contribute considerably to cumulative effects. No analysis is required if the project would not contribute to cumulative effects.

Issues Eliminated from Cumulative Analysis

Some environmental issues are eliminated from the cumulative analysis because they are either site-specific in nature or they would not contribute to cumulative effects. In general, issues with a site-specific component are not considered within a cumulative context. In addition, according to CEQA Guidelines Section 15130(a)(1), an EIR should not discuss impacts which do not result in part from the project evaluated in the EIR. These issues, as well as a brief explanation of the reasons why they would not contribute to cumulative effects, are summarized below.

- Land Use and Planning: Land use compatibility is related to the designated uses and zoning of the applicable jurisdiction, in this case the City of San Jose. All projects are required to conform to designated uses of the City of San Jose General Plan and Zoning Ordinance prior to approval. Development projects in particular must go through the City of San Jose's review process to determine conformity with designated uses, and if required, applicants must apply for a land use zoning amendment for the proposed development parcel prior to project approval and construction. Some cumulative projects may not conform to designated land uses or zoning, but proposed uses are typically compatible with surrounding land uses (e.g., water-related projects within residential areas). Because all projects need to either conform to the appropriate land use designations, cumulative land use impacts associated with other cumulative projects would be less than significant.

---

[4] The geographic scope is important because it may differ for different environmental resource issues. For example, the drainages encompassing the proposed Project area constitute the regional context for surface water effects. For visual quality, the local environment is considered for cumulative effects.

- Public Services: Service ratios of public services (e.g., police and fire protection, schools) are addressed by individual municipalities. The construction and implementation of the proposed project would not have any effects on parks or school services. As such, no further discussion of this topic is required.
- Utilities: The impact identified for the proposed project (i.e., increase in solid waste disposal from the removal of vegetation, sediment, and navigational hazards) would unlikely occur from the implementation of other cumulative projects. As such, no further discussion of this issue is warranted.
- Socioeconomics/Environmental Justice: As described in Section 3.17, the Project would result in either beneficial impacts or no impacts related to socioeconomics/environmental justice (e.g., effects on businesses associated with restoration activities and the increase in recreation use, changes in lifestyles and social interactions, effects on low-income and minority communities, and change in employment opportunities and community tax base). Because the Project would not contribute to any adverse effects for these issues, a cumulative discussion of these topics are not warranted.

Hydrology and Geomorphology

The geographic context for cumulative hydrologic and geomorphic effects is the area in the vicinity of the Project area, within the drainage area (watershed).

Cumulative development and recreation projects are not expected to result in significant hydrologic or geomorphic impacts. However, actions associated with the SBSP Restoration Project, Shoreline Study, and the LGRP would be expected to have effects on these resources. In addition, sea level rise should be considered in the cumulative context due to the anticipated effects of global climate change.

The LGRP provided one-percent fluvial, or riverine, flood protection along Alviso Slough and the Guadalupe River between San Francisco Bay and Interstate 880. Tidal flood protection improvements are expected with the SBSP Restoration Project and the Shoreline Study. Although the actions of the Shoreline Study are not yet defined at this time, one of its primary purposes is to provide tidal flood protection to the South San Francisco Bay area; specifically, tidal flood protection to the community of Alviso would be enhanced if an engineered flood protection levee landward of Ponds A12 and A16 were constructed. However, sea level rise is expected in the future. An analysis of worldwide tide-gauge data consistently shows a rise in sea level of approximately 0.4 to 0.7 foot (0.12 to 0.21 m) over the past century (Intergovernmental Panel on Climate Change [IPCC] 2007). Tide gauge stations along the coast of California show a similar increase (DWR 2006). Models addressing future sea level conditions consistently project an increase in worldwide average sea level. Typical results provided by the IPCC in 2001 are in the range of 0.3 to 2.9 feet (0.09 to 0.88 m) by 2100 (IPCC 2001a). Updated model results provided by the IPCC in 2007 put the range at 0.6 to 1.9 feet (0.18 to 0.58 m) by 2099 (IPCC 2007). However, it is acknowledged that more drastic changes could result if extreme shifts in global oceanic or climatic patterns occur. Under the existing cumulative condition, the combination of cumulative projects and rising sea level would result in a significant cumulative impact related to flooding.

As described in Section 3.1, Hydrology and Geomorphology, the proposed project would reduce the potential for increased fluvial flood risk to a less-than-significant level through the implementation of mitigation measures. The proposed project is expected to minimize effects such that it would not contribute considerably to cumulatively significant impacts. However, the cumulative impacts would remain cumulatively significant.

Actions associated with the SBSP Restoration Project, Shoreline Study, and the LGRP would be expected to have effects related to levee erosion. With restoration of some or all of Ponds A8, A7, A6, A12, A11 and A10 to tidal action under the SBSP Restoration Project, Alviso Slough would scour in response to increased tidal prism. The SBSP Restoration Project includes monitoring of channel scour and levee maintenance as needed to avoid levee erosion associated with the SBSP Restoration Project as long as the levee along the east side of Alviso Slough is required for flood protection. If a flood protection levee is constructed between Ponds A12 and A16 and Alviso (and New Chicago Marsh), the levee along the east side of Alviso Slough downstream of the Alviso Marina County Park would no longer be required for flood protection and scour of the levee would not be an impact. The effects of the potential actions associated with the Shoreline Study are not yet known, but is not expected to result in levee erosion. The activities performed under the LGRP were meant to avoid levee erosion. The effects of the cumulative projects are therefore considered to be less than significant.

As described in Section 3.1, Hydrology and Geomorphology, the potential for the project to result in levee erosion along downstream channel banks is negligible for most alternatives and considered less than significant. Only Alternative 5 would require the implementation of mitigation measures to reduce potential effects to less-than-significant levels. As most of the alternatives would generate negligible effects, and mitigation is available to reduce potential effects to less-than-significant levels for Alternative 5, the project is not expected to contribute considerably to cumulatively significant impacts. Cumulative impacts would remain less than significant.

Water And Sediment Quality

The geographic context for cumulative water and sediment quality effects is the drainage area that encompasses the Project area. Cumulative projects that have similar water and sediment quality issues as the proposed project include those where excavation / dredging would occur in the vicinity of sloughs or within the former salt ponds (including SBSP Restoration Project, Shoreline Study, Alviso Marina County Park Improvement Project, etc.). Due to the scale of the SBSP Restoration Project, Alviso Marina County Park Improvement Project, and the Shoreline Study, they define predominately the cumulative environmental condition.

Potential water and sediment quality impacts (e.g., decrease in DO levels; mobilization, transportation, and deposition of mercury-contaminated sediments; increase in methylmercury production and bioaccumulation; impacts to water quality from other contaminants; and groundwater effects) associated with the SBSP Restoration Project would be less than significant or less than significant with mitigation measures. In addition, potential water and sediment quality impacts of the Alviso Marina County Park

Improvement Project would be less than significant or less than significant with mitigation measures. Because impacts associated with the potential actions of the Shoreline Study are not known in terms of water quality, they are significant for the purposes of this evaluation. As such, cumulative impacts, predominately characterized by the two projects above, would be significant.

As discussed in Section, 3.2, Water and Sediment Quality, the proposed project would result in significant impacts ~~no impact, or less than significant impacts,~~ for the above issues. The impacts on the potential mobilization, transport, and deposition of mercury-containing sediments, PCBs and organochlorine pesticides would be mitigated to a level that is less than significant; however, the potential increase in net methylmercury production and bioaccumulation in the food web cannot be mitigated to a level that is less than significant. As such, the proposed project would ~~not~~ result in a considerable contribution to cumulatively significant impacts related to net methylmercury production and bioaccumulation in the food web. ~~However, cumulative impacts would remain cumulatively significant.~~

All of the above bioaccumulative pollutants were reviewed in this analysis, and found to be regional issues that would ~~not~~ be affected by Project activities in a way that would significantly impact beneficial uses of water.

Biological Resources

The geographic context for cumulative biological resource impacts includes the area in the vicinity of the Project area, within the drainage area.

Implementation of the cumulative projects would result in the construction of facilities (structures and buildings) and restoration. Depending on the locations of these facilities, sensitive biological habitat and associated special-status plants and wildlife could be temporarily affected or permanently removed. The SBSP Restoration Project EIS/R identifies less than significant impacts on biological resources for all the action alternatives with the Adaptive Management Plan, except in the case of the reduction of habitat on ruddy ducks. The Alviso Marina County Park Improvement Project submitted a Biological Assessment to the USFWS and NMFS in February 2009 and Section 7 Consultation under the ESA is currently in progress. The issuance of Biological Opinions from both agencies are pending. In the 1997 Final EIR, all impacts were reduced to non-significance through mitigation measures, and in the 2009 Final EIR Addendum, all potential new impacts identified were mitigated to less than significant primarily through avoidance measures. The impacts on biological resources from implementation of the Shoreline Study potential actions are unknown. For the purposes of this evaluation, potential impacts on biological resources would be significant. Other projects could also result in temporary effects on biological resources from construction activities. Due to the uncertainty of the Shoreline Study, potential cumulative impacts are significant.

As described in Sections 3.3 (Biological Resources – Aquatic) and 3.4 (Biological Resources – Terrestrial), the Project would result in less than significant impacts on aquatic resources from construction-related increases in sediments and turbidity, and the release and exposure of construction related contaminants or legacy contaminants in sediments. In addition, the Project would result in less than significant impacts associated with pond-nesting recurvirostrids, piscivorous birds, foraging habitat for diving and dabbling ducks, special-status plant species, and potential colonization by non-native perennial pepperweed (*Lepidium latifolium*). ~~and impacts related to increased boat use or proposed mitigation measures.~~

The proposed Project would result in significant impacts associated with construction-related release and exposure of legacy contaminants in sediments, construction-related habitat disturbance and effects on fish and other aquatic organisms (such as fish injury and/or entrainment by equipment), conversion of wetland/marsh aquatic habitat to open water habitat, and potential entrainment of fish species into Pond A8. In addition, material stockpiling associated with the Project would result in significant impacts related to special-status, marsh-associated wildlife, other sensitive wildlife species, jurisdictional wetlands, special status plant species, and habitat for nesting birds. Impacts to bird reproduction as a result of increased mercury methylation and bioaccumulation would also result in significant impacts. ~~With the exception of construction-related habitat disturbance and direct effects on fish and other aquatic organisms under Alternatives 2 through 5, m~~ Mitigation measures have been identified to reduce all ~~other~~ significant impacts to less than significant levels, with several exceptions. With implementation of these measures, the project's contribution to cumulatively significant impacts would be less than considerable. Impacts relating to construction-related release and exposure of legacy contaminants in sediments (under Alternatives 1 through 5), construction-related habitat disturbance and direct effects on fish and other aquatic organisms (under Alternatives 2 through 5), and impacts to bird reproduction as a result of increased mercury methylation and bioaccumulation (under Alternatives 1 through 5) cannot be mitigated to a level that is less than significant. For these impacts that cannot be mitigated to a level that is less than significant, the project's contribution to significant cumulative impacts would be considerable. ~~However, c~~ Cumulative impacts would remain cumulatively significant. ~~For construction-related habitat disturbance and effects on fish and other aquatic organisms under Alternatives 2 through 5, the project's contribution to significant cumulative impacts would be considerable.~~

***Impact CUM-1:* Cumulative impacts related to increased boat use.**

As described in Section 3.4.3 (Biological Resources – Terrestrial – Impact TERRBIO-14), disturbance to waterbirds and harbor seals in the South Bay, resulting from additional recreational boat use related to the Project, is expected to result in a less than significant impact. However, plans are underway to complete a new boat launch ramp at the Alviso Marina County Park. The new facilities at the park will in accommodate up to 26 vehicles with boat trailers (Santa Clara County Parks, 2008), enabling individuals with trailered boats to access Alviso Slough and connecting Bay waters, thereby resulting in an increase of recreational boat traffic in the South Bay. Projections indicate there will be 3,836 uses of the marina each year, for an average of 10.5 used per day (Santa Clara County Parks, 2008). The highest use will generally occur on weekends, with peak use occurring on weekends during waterfowl hunting season.

The disturbance related to the increase in boat traffic from the Alviso County Park, coupled with the increase in boat traffic resulting from the Project (described in Section 3.4.3) and existing boat traffic from the SBYC and Blue Whale Sailing School, will result in a cumulatively significant disturbance impact on waterbirds and harbor seals in the South Bay.

Impacts are considered to be **Less Than Significant with Mitigation.** The following mitigation measures would be implemented:

Mitigation CUM-A: Educational signs: Disturbance impacts to waterbirds and harbor seals can be mitigated by the installation of educational signage at the SBYC boat dock, Blue Whale Sailing School, and at the Alviso County Park boat launch site. The signs will be designed to inform the public about the impacts boat disturbance can have on wildlife, inform boat-users of ways to avoid flushing waterbirds, summarize the federal Marine Mammal Protection Act, and outline NOAA Fisheries recommendations of disturbance-free buffers around harbor seals. Additionally, signage will be installed to prevent boaters from entering Pond A8 through the planned pilot channel and armored notch.

Public Health and Vector Management

The geographic context for cumulative public health and vector management impacts is the area immediately surrounding the Project area. Relevant cumulative projects that have the potential to contribute to public health and vector management impacts are the SBSP Restoration Project, Shoreline Study, and other proposed recreation projects due to their locations relative to the Project area. The long-term action alternatives of the SBSP Restoration Project are expected to result in less than significant increases in mosquito breeding habitat, due to the nature of the activities and the adaptive management approach integrated as part of the project. Infrastructural projects (e.g., Shoreline Study) are not expected to increase or decrease breeding habitat. None of the other projects would be expected to result in increases in mosquito populations due to their limited extent of construction (site specific recreational features or distance of the development projects). As such, cumulative impacts would be less than significant.

As described in Section 3.5, Public Health and Vector Management of this EIR, implementation of the Alviso Slough Restoration Project would result in a less than significant increase in mosquito breeding habitat. As such, the proposed project would not contribute considerably to cumulative impacts. Cumulative impacts would remain less than significant.

Geology and Soils

The geographic context for cumulative geology and soils is the south San Francisco Bay region as sesimicity, geology, and soils are typically viewed from a regional perspective. However, potential impacts associated with geological and soils impacts tend to be site-specific in nature, associated with damage to structures at individual locations or harm to people resulting from seismic events, slope stability, or other soil hazards. For example, because the entire Bay Area is susceptible to earthquakes, there is a potential for primary and secondary seismic-related hazards (e.g., ground shaking, liquefaction, etc.) to affect structures and people in the region. Cumulative projects (including residential and commercial projects) could expose people to earthquake hazards if structures are not designed properly, thereby resulting in significant cumulative impacts. In California, all structures must comply with the design parameters of the Uniform Building Code and the California Building Code. Because the proposed project would not require the construction of any structures, it would not contribute to any cumulative effects in this issue area.

Cumulative projects (e.g., development projects, recreation projects, restoration) are not expected to result in slope stability issues, due to topographically flat terrain where new development and recreational features would occur. Restoration activities associated with the SBSP Restoration Project long-term action alternatives would ensure that the integrity of the levees would be maintained. The Shoreline Study potential actions are intended to provide flood protection benefits and as such would likely consider slope and ground failure stability issues. Cumulative impacts of cumulative projects (defined predominately by the Shoreline Study and the SBSP Restoration Project) would be less than significant.

As described in Section 3.6, Geology and Soils, dredging under the proposed Project could result in instability of the levee slope. In addition, levees could also be damaged by seismically induced groundshaking and/or ground failure, leading to flooding of the nearby community of Alviso. However, mitigation measures would be implemented to ensure such effects would be less than significant and its contribution to cumulative impacts would be less than considerable. Cumulative impacts would remain less than cumulatively significant.

Hazards and Hazardous Materials

The geographic context for cumulative hazards and hazardous materials related effects is the drainage area that encompasses the Project area.

Construction of cumulative projects could increase the potential for accidental chemical spills, which could result in adverse impacts to soil, surface water, and groundwater. The RWQCB requires acquisition of a General Permit for Storm Water Discharges from Construction Activity for projects that would disturb one or more acres of land. The permit would require the preparation and implementation of a stormwater pollution prevention plan (SWPPP); the SWPPP identifies best management practices (BMPs) that regulate runoff and discharge into waterways and storm drains. In addition, cumulative projects involving construction activities that store, use, and handle hazardous materials would be required to comply with federal, state, and local regulations to ensure health and safety. Hazardous Materials Management/Spill Prevention Plans, which provides detailed description of hazardous materials management, spill prevention, and spill response/cleanup measures associated with construction activities, are prepared and maintained at the construction sites to ensure health and safety. These practices would not only reduce impacts to less-than-significant levels, but they may also improve existing conditions. As such, cumulative impacts would be less than significant as cumulative projects would be required to implement BMPs consistent with the RWQCB's SWPPP and Hazardous Materials Management/Spill Prevention Plans.

As described in Section 3.6, Geology and Soils, vegetation and root mass removal combined with dredging shallow areas of the slough would disturb the soil and bottom sediment, loosen the surface layer, dislodge soil particles below the water surface, and remove the protective vegetation that prevents erosion by wind and water. A SWPPP would be required to protect any land areas used for staging of equipment and materials as well as access roads. Protective measures would also be required within the slough to minimize transport and redeposition of sediment downstream. As described in Section 3.7, Hazards and Hazardous Materials, potential health risks from diesel and other oils and grease leaking into groundwater aquifers or to surface waters is remote, would be further reduced given the required compliance with the District's BMP (#HM10 – HM14) which limit fueling and equipment servicing to locations outside of waterways, ensure proper handling and storage of hazardous materials, and ensure proper spill prevention training and clean-up equipment on site. In addition, the District would be required to prepare and implement a hazardous materials management/fuel containment plan (see also Section 3.2, Water and Sediment Quality), which would further reduce adverse effects associated with hazardous materials.

Therefore, the proposed project would not result in considerable contribution to less-than-significant cumulative impacts associated with the inadvertent release of hazardous materials during construction activities. Cumulative impacts would remain less than cumulatively significant.

As described in Section 3.7, the Project area has the potential to contain residual hydrocarbons due to past spills and industrial operations. In addition, the vicinity of the Project area is also partially located in the regional South Bay Asbestos Area, which may be a source of asbestos. The cumulative context for the impact associated with the mobilization, transportation, and deposition of asbestos and/or hydrocarbon-contaminated sediments is the Project area and vicinity. Other cumulative projects (e.g., development projects in the community of Alviso and potential actions under the Shoreline Study) would have the potential to result in this impact due to their location. Because the potential for these projects to mobilize, transport, and deposit residual asbestos and hydrocarbons are unknown, for the purposes of this analysis, such effects would be cumulatively significant. Under the proposed project, construction activities would disturb the sediment in the slough that may contain hazardous substances (i.e. petroleum hydrocarbons, asbestos). Therefore exposure of asbestos and/or hydrocarbon-contaminated sediments could occur. However, with mitigation measures proposed as part of the project (soil testing), the project's contribution to cumulative impacts would be less than considerable. Therefore, cumulative impacts would remain cumulatively significant as it relates to the release of asbestos and hydrocarbons.

Air Quality

The San Francisco Bay Area Air Basin (SFBAAB) is the geographic context for cumulative air quality impacts. As discussed in Section 3.8, Air Quality, the SFBAAB is designated as a nonattainment for the state ozone standard (serious) and as a state nonattainment area for PM_{10} (particulate matters 10 microns or less in diameter) and $PM_{2.5}$. In addition, ozone is designated nonattainment (marginal) under national standards. Cumulative projects would generate criteria air pollutants from construction and/or operation of the projects. In addition, construction projects would result in short-term diesel exhaust emissions from on-site heavy duty equipment.

According to BAAQMD, PM_{10} is the pollutant of greatest concern with respect to construction-generated emissions. While construction activities would result in CO and ozone precursor emissions (e.g., ROG and NO_x), these are included in the emissions inventory, which serves as the basis for regional air quality plans, and thus they are not expected to impede attainment of ozone or maintenance of CO standards in the SFBAAB. This is why BAAQMD has no mass emission thresholds for construction emissions of ROG and NO_x and bases its determination of significance for construction emissions on consideration of the dust control measures to be implemented (BAAQMD 1999). Cumulative impacts associated with the generation of dust would be less than significant as all cumulative projects within the basin with the potential to generate this pollutant would be required to implement dust control measures. Dust control measures would not only reduce impacts to less-than-significant levels, but may also improve existing conditions. As described in Section 3.8, the proposed Project would generate short-term construction-related air pollutant emissions, including ROG, PM_{10} and NO_x. Because of the Project's duration and the similarity of construction activities to maintenance activities, an evaluation of the Project emissions against the BAAQMD operational significance thresholds was conducted. Based on the analysis, the project would exceed the operational significance thresholds for PM_{10} and NO_x. To reduce impacts associated with the generation of PM_{10} to a less-than-significant level, basic and enhanced dust control measures would be implemented. With this measure, the project's contribution to cumulative impacts would not be considerable, and cumulative impacts would remain cumulatively significant. However, no mitigation measures are available to reduce the increase in NO_x and the impact would remain significant. Because NO_x is included in the emissions inventory, they are not expected to impede attainment of ozone in the SFBAAB.

To meet the state's one-hour ozone standard, BAAQMD prepared the Bay Area 2005 Ozone Strategy, which is a roadmap showing how the Basin will achieve compliance with the state one-hour air quality standard for ozone as expeditiously as practicable and how the region will reduce transport of ozone and ozone precursors to neighboring air basins. The 2005 Ozone Strategy, which was adopted by BAAQMD's Board of Directors on January 4, 2006, describes how the Basin will fulfill the CCAA planning requirements for the state one-hour ozone standard and transport mitigation requirements through the proposed control strategy. The control strategy includes stationary source control measures to be implemented through BAAQMD regulations; mobile source control measures to be implemented through incentive programs and other activities; and transportation control measures to be implemented through transportation programs in cooperation with MTC, local governments, transit agencies and others. BAAQMD will continue to adopt regulations, implement programs and work cooperatively with other agencies, organizations and the public on a wide variety of strategies to improve air quality in the region and reduce transport to neighboring air basins. It is not currently anticipated that marginal areas will be required to prepare attainment demonstrations for the eight-hour standard. (BAAQMD 2006). With the implementation of the Ozone Strategy, cumulative impacts resulting from all cumulative projects, including the proposed project, would be cumulatively less than significant.

The geographic context for cumulative diesel PM-related impacts is different from that described above and includes the proposed Project area and surrounding area because of the dispersive nature of diesel PM_{10}. Only projects utilizing off-road construction equipment in the immediately vicinity of the proposed project would be considered for cumulative impacts (including the SBSP Restoration Project and the Shoreline Study). Because construction activities would be temporary, the properties of diesel PM is highly dispersive, future reductions in exhaust emissions are expected, and the distance of the cumulative projects from one another, impacts resulting from cumulative projects associated with the exposure of sensitive receptors to substantial TAC emissions would be less than significant. As discussed in Section 3.8, short-term construction activities are not expected to expose sensitive receptors to substantial TAC emissions given the distances of most sensitive receptors. As such, the project's contribution to cumulative impacts would be less than considerable, and cumulative impacts would remain less than cumulatively significant.

Short-term construction and operation of the proposed project would generate emissions of GHGs. Both construction-generated and operational emissions would be associated with vehicle engine exhaust. Mobile-source emissions of GHGs would include exhaust from off-road, heavy-duty construction equipment, on-road haul trucks, worker commute trips, and operation and maintenance activities.

GHG emissions generated by the proposed project would predominantly be in the form of CO_2. In comparison to criteria air pollutants, such as ozone and PM_{10}, CO_2 emissions persist in the atmosphere for a much longer period of time. While emissions of other GHGs, such as CH_4 and N_2O, are important with respect to global climate change, the emission levels of these other GHGs for the sources considered for this project are relatively small compared with CO_2 emissions.

CO_2 emissions were calculated for the proposed project. Emission factors and calculation methods for GHGs from construction or development projects have not been formally adopted for use by the state or BAAQMD. The most recent version of the URBEMIS 2007 model, which is widely used for estimating criteria air pollutant and precursor emissions, includes estimations of CO_2 emissions.

The proposed project is anticipated to generate worst-case CO_2 emissions of approximately 1,893 tons (1,717 metric tons) during the first year of construction. Approximately 165 tons (150 metric tons) would be expected to occur during the next 10 years during project operation and maintenance. It was assumed that maintenance activities would occur for approximately 3 months per year, during the 10 year period. Thus, the proposed project would result in a worst-case total mass of approximately 3,367 tons (3,054 metric tons) of CO_2 emissions during the project cycle.

Vegetation removal (up to 15.3 acres in the case of Alternative 5) would be considered an indirect emission source, since the project involves the removal of a CO_2 sink (CO_2 is sequestered through uptake by vegetation). The vegetation would be disposed of at a landfill, where it would decompose and release GHGs back into the atmosphere. The equivalent indirect CO_2 that would result from this process is unknown at this time, but would be an additional increment to the above-calculated 3,367 tons CO_2 (3,054 metric tons).

No project alone would contribute a quantity of GHG emissions that would result in a noticeable incremental change to the global climate. Suffice to say, that quantity would be large, and global climate change is occurring as a result of the cumulative effect of project development around the world. Thus, the context for examining GHG emissions becomes more important than the mass of emissions itself. According to California Energy Commission's Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004, California's statewide inventory of GHG emissions was 497 million metric tons in 2004. Legislation and Executive Orders on the subject of climate change in California placed an enforceable statewide cap on GHG emissions, mandating that annual GHG emissions be reduced to 1990 levels by the year 2020, and 80 percent below 1990 by the year 2050. Nothing in the legislation states intent to limit population or economic growth in the State; thus, emission reductions must occur with 30 years of growth in place between 1990 and 2020. Statewide GHG emissions during 1990 were 436 million metric tons/year (CEC 2006).

While any increase in GHG emissions would add to the quantity of emissions that would contribute to global climate change, emissions associated with the proposed project are comparatively small. For example, the limits set by the CARB AB 32 working group that will specify GHG calculation, reporting, and verification requirements for specific industrial sectors in California will be applied to industries with greater than 25,000 metric tons of CO_2 emissions per year. (The proposed project would generate approximately 3,000 metric tons over the project's 10 year maintenance cycle). Though the project would result in a net increase in GHG emissions and contribute to an adverse cumulative impact, it is not expected that the emissions that would occur associated with the proposed project's construction and maintenance would substantially impede California's implementation of GHG emission reduction targets.

The project's contribution to GHG emissions is therefore considered insubstantial, and result in a less-than considerable contribution to global climate change. This cumulative impact is less than significant.

Noise

The geographic context for cumulative noise impacts includes the project area and surrounding area. Cumulative projects in the immediate vicinity of the proposed Project area include Phase 1 actions at Pond A8, future phase(s) of the SBSP Restoration Project, construction and maintenance of the boat launch ramp as part of the Alviso Marina County Park Improvement Project, and potential actions of the Shoreline Study in the vicinity of the Project area. Potential noise effects from the construction/operation of other cumulative projects are not considered in the cumulative analysis due to their distance from the project area. Stationary noise sources would be addressed by compliance with the standards established in noise ordinances. Compliance with these standards would ensure that the cumulative projects would be less than significant.

As described in Section 3.9, noise impacts would occur associated with construction activities. While implementation of the mitigation measure would reduce exposure of nearby sensitive receptors to construction noise and groundbourne vibration, construction noise and vibration levels attributable to certain proposed activities would exceed applicable standards. As such, potential noise impacts resulting from the project would be significant and unavoidable, and the contribution to cumulatively less-than-significant noise levels would be considerable. Cumulative impacts would therefore be significant.

The geographic context for cumulative truck traffic noise includes the traffic network affected by the proposed Project. Traffic-related noise impacts on sensitive receptors occur when several thousand vehicles are on a roadway. Cumulative projects, including development projects and restoration projects generate traffic during both construction and operation. Because the precise number of construction-related vehicles generated by these projects is not known, for the purpose of this analysis, cumulative impacts are significant. As described in Section 3.9, heavy-duty truck travel on proposed haul routes associated with the project would not exceed the applicable transportation noise source standard of 60 dB DNL at existing nearby sensitive receptors with the implementation of mitigation measures. Because the potential for a three dB increase in local road traffic noise levels due to the project may still exist, the project contribution would be considerable, and overall impacts would be cumulatively significant.

Recreation

The geographic context for cumulative recreation resource impacts includes the Project area and surrounding area. Cumulative projects, including other recreational projects, the Alviso Marina County Park Improvement Project, the South Bay Salt Pond Restoration Project Phase 1 Action at Pond A8 located immediately west of the Project area and subsequent phases of the SBSP Restoration Project could temporarily disrupt recreation by closing or encroaching on existing recreational facilities during construction activities. The impacts of the Shoreline Study potential actions are not known but are presume to have an adverse, temporary impact on existing recreation facilities during construction. However, cumulative recreation projects are expected to increase recreational opportunities overall (use and public access) in the long-term and thus result in beneficial effects. Cumulative impacts from implementation of related projects would therefore be less than significant/beneficial.

As described in Section 3.11, Recreation, the proposed project would not result in any adverse effects on existing recreational use that could lead to substantial physical deterioration or alteration. In addition, implementation of the proposed project would result in improvements to recreational and navigational opportunities in the slough. As such, proposed project's contribution to cumulative effects would be less-than-significant and cumulative impacts would remain less than cumulatively significant/beneficial.

Cultural Resources

The geographic context for cumulative cultural resources impacts includes the far South Bay. Excavation activities associated with the cumulative projects could encounter known or unknown historic or prehistoric cultural resources, including Native American burials. Damage of these resources could contribute to a reduction of unique and important cultural resources. The sponsors of the cumulative projects are required to take appropriate measures to protect or preserve cultural resources affected by their projects. Surrounding projects would be required to abide by standard mitigation measures regarding the protection of culturally sensitive resources. Therefore, compliance with standard mitigation measures would ensure that potential cumulative impacts would be reduced to a less-than-significant level.

As described in Section 3.12, Cultural Resources, impacts to known cultural resources would be less than significant. Impacts to as-yet unknown cultural resources would be less than significant with the implementation of mitigation measures proposed as part or the project. Thus, the contribution of cumulative impacts from the proposed project would be less than considerable. Cumulative projects would remain less than cumulatively significant.

Traffic

The geographic context for cumulative traffic impacts includes the traffic network affected by the proposed Program, including the streets that provide access to the site, staging areas, and the landfills. These roadways include, but are not limited to Gold Street, North 1st Street, Taylor Street, Hope Street, and Highways 80 and 237. Cumulative projects (including development projects and restoration projects) would generate traffic trips associated with construction and/or operation. The SBSP Restoration project would generate traffic trips during construction activities. However, it includes mitigation that would require avoidance of peak-hour traffic. The impacts of the Shoreline Study potential actions are unknown, but are expected to generate impacts during construction activities. Large residential, commercial, and industrial developments would increase the overall, long-term traffic volume in the region through the increase in people living/working in the area and their associated travel on local/regional roads. In sum, because the number of construction- and operation related truck trips is not known for the combination of cumulative projects, implementation of cumulative projects would likely result in cumulatively significant traffic impacts on area roadways. In addition, the increase in construction-related truck traffic would also increase the wear and tear of local and regional roadways, thus resulting in cumulatively significant impacts. Due to the dispersed nature of the cumulative projects, sufficient parking is likely available to accommodate expected uses (existing or proposed parking as part of cumulative projects would meet expected demand). Cumulative parking impacts from cumulative projects would be less than significant.

As described in Section 3.13, traffic levels associated with the proposed project would increase in the short term, while vegetation and root mass removal activities are underway. However, it would be considered significant as the Project would contribute traffic to existing roadways that are already performing at unacceptable levels. A mitigation measure to limit traffic to specific hours would be required to reduce potential adverse effects to less than significant. In the long term, potential increases in traffic levels associated with increase use of Alviso Slough would be minimal and parking demand would be less than significant. The project would also increase the wear and tear of the haul roads, necessitating the implementation of a mitigation measure to reduce potential impacts. The contribution of the proposed project to cumulatively significant traffic impacts (roadway degradation, parking, and wear and tear of the roadway) would be less than considerable with the implementation of the mitigation measure for the short-term construction effects. Cumulative impacts would remain less than cumulatively significant. If project work entailed the use of suction dredging, with a pipe slurry method of sediment disposal in the vicinity of the Project area, the impact of truck traffic could be substantially reduced.

Public Services

The geographic context for cumulative recreation resource impacts includes the City of San Jose. Any cumulative project within San Jose, particularly development projects (residential, commercial and industrial projects) would be relevant. Development projects would increase the demand for fire and police protection services. The City of San Jose responds to increases in demand for emergency services by expanding their fire and police protection departments in keeping with their service ratio goals. Based on this response, the City plans for future growth to ensure that sufficient services are provided. Increased demand for public services for future projects would be supported through development impact fees or similar financing mechanisms that the developers would be required to pay. Cumulative projects would therefore result in a less than significant cumulative impact on public services.

As described in 3.14, Public Services, the Alviso Slough Restoration Project would not result in or require new or altered government facilities to provide additional public services. As such, the project would not increase demand for fire or police protection services and impacts would be less than significant. Cumulative impacts would be less than cumulatively significant.

Aesthetics

The geographic context for cumulative recreation resource impacts includes the viewshed containing the Alviso Slough Restoration Project area. Construction activities of all cumulative projects would result in some visible change in the environment. However, some of these changes would be small in scale (e.g., certain recreational features such as a kayak ramp) while other changes would be larger in scale (e.g., restoration of the Alviso pond complex under the SBSP Restoration over the 50-year period or new structures associated with residential/commercial/industrial development). These projects would be visible from different vantage points and from various distances (short-, medium-, and long-range). The SBSP Restoration Project EIS/R identifies less-than-significant / beneficial impacts associated with restoration activities. The Shoreline Study potential actions in the vicinity of the proposed Project area may include construction of levees and floodwalls that could obstruct views of the Bay and other scenic features. Although changes may occur along the shoreline associated with the proposed project, it may not necessarily be adverse. However, because it is not known whether the cumulative projects would obstruct views, or where facilities obstructing views would be constructed, the potential effects on views cannot be evaluated. Consequently, impacts on views resulting from cumulative projects would be potentially significant.

As described in Section 3.16, Aesthetics, visual changes would be visible from long-and medium-range views but would be more noticeable from the short-range from trails along the nearby levee and park. However, such a change would be less than significant (and may be perceived as beneficial to some). Due to the limited scale of the proposed project, its contribution to cumulative impacts would be less than significant. However, cumulative impacts would remain potentially significant.

5. Mitigation Monitoring and Reporting Program

Chapter 5 presents the Mitigation Monitoring and Reporting Program (MMRP). The mitigation measures and Best Management Practices (BMP) contained in the MMRP Table ~~here~~ are compiled from the measures identified in Chapter 3 of this EIR. For each, the ~~reporting needs,~~ timeframe for implementation, responsibility party for implementation, and responsibility for oversight are identified.

~~In addition to the specific reporting requirements identified below, t~~The District will prepare annual mitigation monitoring reports summarizing compliance with these ~~each~~ mitigation measures consistent with its ISO 14001 Regulatory Compliance Procedures (Q840D01) per CEQA Guidelines § 15097 and permit reporting conditions. ~~identified below. The annual report need not be elaborate or extensive, but will contain:~~

- ~~Indication of compliance with each mitigation measure;~~
- ~~List of individual reporting prepared that year;~~
- ~~List of key incidents and corrective actions taken;~~
- ~~Biological and other monitors responsible for carrying out mitigation implementation, and the District staff responsible for oversight; and~~
- ~~Necessary changes to the MMRP, if any.~~

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
Hydrology and Geomorphology						
Increased fluvial flood risk.	1, 2, 3, 4, 5	**HYD-A. Lower Pond A8 Weir** The District shall lower the Pond A8 weir to maintain the existing flow split between the Pond A8 weir and Alviso Slough, thereby maintaining existing flows and levels of flood protection downstream of the site during flood events. The District (2007) performed hydraulic modeling for each alternative to estimate the extent to which the Pond A8 weir would need to be lowered to maintain the flow split estimated for existing conditions. Model results indicate that the existing weir at Pond A8 would need to be lowered to the dimensions listed in Table 3.1-5 [of this EIR] to maintain the existing flow split for Alternatives 1 through 5.	One report (Final Plans and Specifications) to identify final methods and timeframes to complete the measure.	During construction	District	District
Increased fluvial flood risk.	1, 2, 3, 4, 5	**HYD-B: Modify maintenance limits to reduce potential increase in fluvial flood risk.** The potential for the Project (and its maintenance limits) to increase fluvial flood risk (including Guadalupe Slough) shall be evaluated by the District through hydraulic modeling during the design phase in coordination with LGRP monitoring and modeling described above). If model results indicate an unacceptable increase in fluvial flood risk, the Project maintenance limits would be modified to maintain conditions more similar to post-project conditions (i.e., less sedimentation allowed and more frequent maintenance). These maintenance limits shall be established and maintained by the District to maintain flood protection in accordance with the LGRP.	One report (Operations and Maintenance Program) to identify methods and timeframes to complete the measure, prior to construction.	Pre-construction (during the design phase)	District	District

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
Increased fluvial flood risk.	1, 2, 3, 4, 5	**HYD-C: Implement measures to maintain flood protection if Project maintenance is ceased.** If Project maintenance is ceased in the long-term, the fluvial flood impacts of allowing the Project area to silt back in and re-vegetate would be evaluated through hydraulic modeling during the design phase. Hydraulic modeling would be performed in coordination with LGRP monitoring and modeling described above for the maintenance period. Any potential impact identified by the modeling would be mitigated prior to discontinuing maintenance. For example, the Pond A8 weir may be modified to maintain an acceptable flow split between Alviso Slough and the Pond A8 complex as determined by the LGRP. Implementation of flood protection measures through the South San Francisco Bay Shoreline Study or restoration actions through the SBSP Restoration Project could address fluvial flood risks in the long-term.	None	Identification of measures during the design phase; implementation of measures prior to discontinuing maintenance	District	District
Increased levee erosion along downstream channel banks.	5	**HYD-D: Monitoring and inspections.** Channel widening shall be monitored and the levees would be regularly inspected after Project implementation as stated in the Maintenance Program section of the Project's Engineer's Report (EDAW, PWA et al. 2008). Levees along Guadalupe Slough shall be inspected after an extreme event that triggers an overflow from Alviso Slough to Pond A8 and the other adjoining ponds (A5 – A7) in that complex. This inspection shall assess any damages or erosion to these levees as a result of the flood management practices in place. As discussed in the Maintenance Program section, monthly monitoring and levee inspections shall be performed initially, then annually, and	Annual reporting over project life.	Post-construction (over project life); levees along Guadalupe Slough will be inspected post-extreme event that triggers an overflow from Alviso Slough to Pond A8 and other adjoining ponds in that complex	District	District

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		after major rainfall or tidal storm events. The maintenance of or improvements to Alviso Slough levees downstream of the Project shall be performed by District as per its responsibility for impacts directly attributable to this project.				
Increased levee erosion within the Project area.	1, 2, 3, 4, 5	**HYD-E: Regular inspection of levees within Project area.** The levees within the Project area shall be inspected regularly after Project implementation as stated in the Maintenance Program section of the Project's Engineer's Report (EDAW, PWA et al. 2008). Alviso Slough levees within the Project area shall be maintained or improved as needed (grading, armoring) to maintain flood protection and protect managed ponds from daily tidal inundation. This work would require ongoing coordination with USFWS.	Annual reporting over project life.	Post-construction (over project life)	District	District
Increased fluvial flood risk.	1, 2, 3, 4, 5	**HYD-F: Coordination with operations and maintenance of Pond A8 Phase 1 Action.** The Alviso Slough Restoration project shall be coordinated with USWFS's operations and maintenance of the Pond A8 Phase 1 Action, taking into account post-construction, maintenance period, and long-term conditions for the Alviso Slough Restoration Project, so that operation of the Pond A8 notch does not increase the fluvial flood risk. Modeling shall be conducted to assess the combined effects of the Alviso Slough Restoration Project and the Pond A8 restoration with the notch open in the winter. If modeling indicates a potential flood impact, the Pond A8 notch shall be closed in the winter. Requires coordination with USFWS.	Modeling report identifying the effects of combined operation	Prior to operation of Pond A8 notch in winter	District	District
Increased levee erosion along	1, 2, 3, 4, 5	**HYD-G: Monitor channel widening, inspect levees, and maintain or improve levees.** The	Annual reporting	Post-construction	District	District,

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
downstream channel banks.		District shall assess in greater detail in the design phase the potential for levee erosion due to the cumulative increase in tidal prism from the Alviso Slough Restoration Project and the Phase 1 Action at Pond A8. The District shall coordinate with the USFWS's operation of the Pond A8 notch such that the predicted scoured channel width for Alviso Slough would be less than or equal to the distance between the east bank and west bank levee toes. The District shall monitor the channel widening and inspect the levees regularly after Project implementation as stated in the Maintenance Program section of the Project's Engineer's Report (EDAW, PWA et al. 2008). The District shall maintain or improve the Alviso Slough levees downstream of the Project (e.g., grading, armoring) as per its responsibility for impacts directly attributable to the Alviso Slough Restoration Project. Coordination with USFWS on its Pond A8 Phase 1 Action shall take into account post-construction, maintenance period, and long-term conditions for the Alviso Slough Restoration Project.	over project life.	(over project life)		USFWS
Water and Sediment Quality						
~~No Mitigation Measures Required.~~						
Potential to mobilize, transport, and deposit mercury-contaminated sediments.	1, 2, 3, 4, 5	**Mitigation Measure WQ-A: Drill cores and analyze sediment samples in the construction area to determine sediment disposal or reuse options and the resulting contaminant concentrations in sediments exposed by dredging and vegetation removal.** • Sediment cores will be drilled and samples will be collected and analyzed to determine the concentrations of mercury, PCB's and	Over project life.	Construction	District	District; RWQCB

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		organochlorine pesticides in sediments at various depths and to characterize the sediment for disposal and that will be exposed at the dredged channel bottom. • Over-dredging of sediments may be considered if the contaminant levels below the proposed dredging depth are significantly higher than those in the sediments to be removed and where deemed beneficial to Mercury or PCB TMDL goals. • Sediments will be disposed upland or re-used in wetland foundations (non-cover) according to LTMS guidelines, based on the results of sample analysis.				
Potential to mobilize, transport, and deposit mercury-contaminated sediments.	3, 4, 5	**Mitigation Measure WQ-B: Choose methods of dredging that minimize dispersion of suspended sediments.** Hydraulic, as opposed to mechanical, dredging will reduce turbidity and dispersal of sediments mobilized by dredging activities. The dredging permit applications will also propose to include mitigation measures such as silt shrouds and use of flocculants (e.g., polyacilamide) to reduce sediment dispersal.	Dredging permit reporting.	Construction	District	District; RWQCB
Potential to increase net methylmercury production and bioaccumulation in the food web.	1, 2, 3, 4, 5	**Mitigation Measure WQ-C: Coordinate with the South Bay Salt Pond Restoration efforts to communicate information to the public regarding Mercury effects.** To understand any possible increases in methylmercury production resulting from the project, studies will be conducted to support adaptive management strategies. Monitoring results will be provided to the SFRWQCB and used to improve the effectiveness of future maintenance and restoration efforts. Information	Monitoring results report; over project life.	Over project life	District	RWQCB

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		from the studies will be communicated to the public consistent with the San Francisco Bay Mercury TMDL risk communication and reduction programs.				
Potential to increase net methylmercury production and bioaccumulation in the food web.	1, 2, 3, 4, 5	**TERRBIO-B.** See below				
Potential to mobilize, transport, and deposit PCBs and organochlorine pesticides.	3, 4, 5	**WQ-A.** See above **WQ-B.** See above				
Biological Resources - Aquatic						
Construction-related release and exposure of legacy contaminants in sediments.	1, 2, 3, 4, 5	**WQ-A.** See above **WQ-B.** See above **WQ-C.** See above **TERRBIO.** See below				
Construction-related habitat disturbance.	1, 2, 3, 4, 5	**AQBIO-A: Maintain Minimum 20-foot Marsh Buffers Along Upland Margins of Alviso Slough.** The interface of marsh habitat with the open water areas is the zone that supports primary macroinvertebrate production and the majority of marsh fish species. Additionally, this interface is the zone where detritus inputs, important to the food web, occur. Minimum marsh buffers of 20	One report prior to construction (Final Plans & Specifications); monthly reports during construction; one final report within 60 days following completion	Prior to and during construction	District or its designated Construction contractor	RWQCB

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		feet wide along the margin of Alviso Slough (from upland edge inward) shall be maintained, to the extent feasible, to ensure that there is minimal net loss in this habitat type (i.e., vegetated marsh edge) or function. The minimum buffer width may be modified through consultation with appropriate resource agencies (e.g., USFWS, NMFS, and CDFG).	of construction.			
Construction-related habitat disturbance.	1, 2, 3, 4, 5	**AQBIO-B: Evaluate and Monitor Macroinvertebrate Community Response to Disturbance and Deliver Bi-Annual Reports during and after Initial Construction to the District, NMFS, and other Applicable Resource Agencies for a Period of 2 years Following Initial Construction.** Prior to and after vegetation removal and dredging activities, The District shall monitor the aquatic macroinvertebrate community in the Project area to identify and measure its response to disturbance in coordination with the NMFS, CDFG, and USFWS and other applicable resource agencies. Prior to and after Project activities, samples of the macroinvertebrate community shall be taken twice annually (i.e., spring and fall) at two sites that are representative of different habitat conditions (i.e., inundated mudflat and vegetated edge) within the proposed construction area. Additional samples shall also be taken at sites up and downstream of the construction area as reference samples. This data shall be used to augment existing data already collected in the Project area (establish baseline conditions) and to measure change in the community as a result of disturbance. Standardized bioassessment procedures (field and laboratory) shall be used to collect and analyze the macroinvertebrate community. Aquatic	Bi-annual reports during and after construction	Prior to and after vegetation removal and dredging	District and/or its designated qualified biologist(s)	NMFS; other resource agencies

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		macroinvertebrate samples shall be described by sample volume or weight, number of taxa, and relative abundance of dominant taxa. Standard metrics for tolerant/intolerant taxa shall also be used as a proxy for determining general aquatic ecological health. Comparison of data (pre- and post-disturbance) shall include statistical analysis to determine whether a significant change (decline) in abundance or structure has taken place. Should the monitoring results prove that the community (abundance and structure) has not fully responded after one year from completion of the initial vegetation removal and dredging activities, reoccurring vegetation removal and dredging shall not proceed and the resource agencies will be notified. Investigation of the cause of the decline/lack of response shall be conducted and additional corrections in construction operations shall be made where applicable. Prior to implementation of the monitoring and evaluation program, a monitoring and evaluation plan shall be developed and provided to the resources agencies for review. The plan shall include details regarding methodology, evaluation, standards, and reporting. If necessary, the methods, standards, and reporting requirements may be revised in coordination with the resource agencies. This mitigation measure may be modified based on additional conditions imposed as part of the required permits from the USACE, RWQCB, USFWS, NMFS, and/or CDFG.				

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
Conversion of wetland / marsh aquatic habitat to open water habitat.	1, 2, 3, 4, 5	**AQBIO-A.** See above **TERRBIO-B.** See below				
Increased entrainment of fish species into Pond A8.	1, 2, 3, 4, 5	**HYD-A.** See above				
Biological Resources - Terrestrial						
Potential construction-related loss of, or disturbance to, special-status, marsh-associated wildlife.	1, 2, 3, 4, 5	**TERRBIO-A: Construction timing to avoid breeding seasons.** Construction-related activities shall be restricted to the non-breeding season for special-status, marsh-related wildlife species. This shall limit activities to the period September 1 through February 28. If seasonal avoidance is not practicable, pre-construction surveys would be conducted to determine if there is a potential for special-status species to occur in the vicinity of the disturbance. If an inactive nest is located in these areas, it would be removed before the start of the breeding season (approximately February 1) if possible. The District shall also remove all vegetation from the construction zones during the nonbreeding season to minimize effects on nesting birds. If construction occurs during the breeding season and all affected vegetation has not been removed, a qualified biologist shall survey the construction area for active nests and young migratory birds immediately before construction. If special-status species are located, communication with the USFWS and CDFG shall be implemented to determine the appropriate response. These actions	Report (Final Plans & Specifications) prior to construction/ maintenance cycles.	Prior to and during construction (within 6 months of construction start).	District and/or its designated qualified biologist(s)	District

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		may include avoidance measures such as establishing construction setbacks from detected nests, delay in construction until nesting is complete, or slight modifications to the Project impact footprint.				
Potential construction-related loss of, or disturbance to, special-status, marsh-associated wildlife.	1, 2, 3, 4, 5	**TERRBIO-B: 2:1 replacement of tidal wetland habitat.** The restoration of historic tidal marsh habitat within the South Bay at a ratio of 2:1 (e.g., 5.2 acres restored for impacts to 2.6 acres of tidal marsh habitat) would be implemented to offset the impacts to wetlands from the Project. A 2:1 mitigation ratio is appropriate based on the quality of the habitat that is being impacted and the temporal loss of habitat functions, and values while the mitigation wetlands are developing. Numerous feasible mitigation avenues to create 5.2 acres (or greater) of tidal wetland habitat are present in the vicinity, such as at Pond A4. Other mitigation options include contributing to ongoing tidal marsh restoration Projects, such as Pond A6, that are part of the overall SBSP Restoration Project. Additional phases of the SBSP Restoration Project envision restoring tidal marsh in extensive areas of former salt ponds. Mitigation for this Project could occur at one of the future tidal restoration sites, as any tidal wetland restoration within the upper reaches of the Refuge would serve as appropriate in-kind mitigation. Mitigation could take the form of paying an in lieu fee to the restoration program, or implementing a discrete restoration action within the Alviso pond complex. For example, the District funded the restoration of Ponds A19, A20, and A21 as mitigation for their SMP and the LGRP. These	One report identifying a plan to create mitigation prior to permit application; one report post-construction annually for the required 5-year monitoring period.	One report prior to permit application; one report post-construction annually for the required 5 –year monitoring period.	District	USACE, RWQCB

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		types of agreements would require approval from the USFWS as well as other regulatory agencies. If the District undertakes a discrete wetland mitigation project separate from the SBSP program, a Mitigation and Monitoring Plan (MMP, separate from the MMRP in Chapter 5 of this EIR) shall be prepared outlining the details of the proposed wetland mitigation, and submitted to the regulatory agencies as part of the project's permit application. Mitigation habitat must be tidal wetland habitat (freshwater, brackish, or salt marsh) within the Alviso pond complex of former salt-production ponds, designed to maximize species diversity, to provide high productivity marsh habitat, and to establish habitat values that are similar or greater to that which is being removed. A monitoring plan shall be developed for any mitigation site planned for this Project to ensure success of the created tidal marsh habitat. The mitigation site shall be deemed successful when the site has achieved a target percent cover by native wetland vegetation (such as the 70 percent cover being targeted by the SBSP Restoration Project within 5 years of reaching the appropriate colonization elevation) with active invasive species control (i.e., treatment of any invasive species that colonizes the site) for at least the first five years. As part of an overall mitigation package, other marsh enhancement opportunities in the Project vicinity would be considered, such as increasing resources in the existing programs for removal of non-native invasive species (e.g., saltmarsh cordgrass (*Spartina alterniflora*) and its hybrids, giant reed (*Arundo donax*)) or the creation or enhancement of high marsh-upland transition				

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		areas.				
Potential disturbance to, or loss of, sensitive wildlife species due to maintenance activities.	1, 2, 3, 4, 5	**TERRBIO-A.** See above	See above	See above	See above	See above
Potential construction-related loss of, or disturbance to pond-nesting Western snowy plovers.	1, 2, 3, 4, 5	**TERRBIO-C: Avoid western snowy plover breeding season:** Construction-related activities shall be restricted to the non-breeding season for western snowy plovers. This would limit activities to the period roughly corresponding to 15 September through 1 April. If seasonal avoidance is not practicable, pre-construction surveys shall be conducted to determine if there is a potential for Western Snowy Plovers to occur in the vicinity of the disturbance. If western snowy plovers are located, consultation with the USFWS and CDFG shall be initiated to determine the appropriate response. These actions may include avoidance measures such as establishing construction setbacks from detected nests, delay in construction until nesting is complete, or slight modifications to the Project impact footprint.	Report specifying why avoidance was not possible (if that is the case) immediately following decision on project construction schedule. Report findings of pre-construction surveys within 2 weeks of survey. Report specifying avoidance measures identified in consultation with the USFWS and CDFG (if conducted) to be included in the implementation plan for this measure, if necessary.	Prior to and during construction (within 6 months of construction start).	District	District and/or CDFG and/or USFWS
Impacts to tidal marsh habitat through removal of vegetation and dredging.	1, 2, 3, 4, 5	**TERRBIO-B.** See above	See above	See above	See above	See above

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
Impacts to jurisdictional wetlands.	1, 2, 3, 4, 5	**TERRBIO-B.** See above	See above	See above	See above	See above
Impacts related to stockpiling of materials.	1, 2, 3, 4, 5	**TERRBIO-A.** See above **TERRBIO-C.** See above **TERRBIO-D: Pre-construction special status plant species surveys.** Impacts to Congdon's tarplant from stockpiling of material is highly unlikely. However, in the rare event that wind-dispersed seed from known nearby populations of this species comes into a recently disturbed area within upland, alkaline soils (suitable habitat), it is likely that the population would be very small and ephemeral in nature. Areas proposed for the stockpiling of material shall be surveyed immediately prior to use. If special status plant species are located, an alternative stockpiling site shall be utilized, or protective fencing shall be installed around the sensitive plants.	See above See above Report on survey findings to be prepared immediately following survey.	See above See above Prior to construction	See above See above District or its designated - qualified biologist(s).	See above See above District

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
Impacts related to recreational boat use.	1, 2, 3, 4, 5	**CUM-A. Educational signs.** Disturbance impacts to waterbirds and harbor seals can be mitigated by the installation of educational signage at the SBYC boat dock, Blue Whale Sailing School, and at the Alviso County Park boat launch site. The signs will be designed to inform the public about the impacts boat disturbance can have on wildlife, inform boat-users of ways to avoid flushing waterbirds, summarize the federal Marine Mammal Protection Act, and outline NOAA Fisheries recommendations of disturbance-free buffers around harbor seals. Additionally, signage will be installed to prevent boaters from entering Pond A8 through the planned pilot channel and armored notch.	None	Post-construction	District and/or its designated qualified biologist(s)	District
Impacts to bird reproduction as a result of increased mercury methylation and bioaccumulation.	1, 2, 3, 4, 5	**WQ-C.** See above **TERRBIO-B.** See above				
Public Health and Vector Management						
No Mitigation Measures Required.						
Geology and Soils						
Excavation or dredging during construction could cause slope instability.	3, 4	**GEOL-A: Implement dredge limits from the toe of the levees and conduct additional geotechnical review as needed.** The District shall not dredge within 10 feet of the toe of the flood control and salt pond levees and shall not dredge deeper than 16-feet as proposed in Alternative 4. If the District intends to dredge beyond these established limits, then additional	Report on additional detailed geotechnical review as needed; prior to construction.	Prior to construction.	District	District

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
Project or nearby structures could be damaged by seismically induced groundshaking and/or ground failure.	3, 4, 5	**GEOL-A.** See above **GEOL-B.** See above **GEOL-C.** See above	See above	See above	See above	See above
Hazards and Hazardous Materials						
Potential to mobilize, transport, and deposit asbestos, hydrocarbon-contaminated sediments, and/or mercury.	1, 2, 3, 4, 5	**HAZMAT-A: Conduct Soil Testing for Asbestos and Petroleum Hydrocarbons Prior to Sediment Disturbing Activities and Remove Contaminated Soils as Needed.** The District or construction contractor shall conduct soil testing for asbestos and petroleum hydrocarbons in the areas proposed for vegetation/root mass removal, dredging, lowering of the weir, and other flood protection improvement activities. Testing for asbestos shall meet EPA Standard Method "ASBESTOS" focusing on areas of apparent fill (including path observed to contain construction debris and suspected serpentine-containing gravel, as well as the areas close to the Pond A8 overflow weir, where fill was discovered). Petroleum hydrocarbon testing methods shall meet EPA 8015M and EPA 8260B standards. If testing results show the presence of unacceptable levels of asbestos and/or petroleum hydrocarbons, the District or its construction contractor shall remove and dispose the contaminated soil and vegetation according to the regulatory agencies' requirements.	Report indicating test results, prior to construction.	Prior to construction.	District	District

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
Potential to mobilize, transport, and deposit asbestos, hydrocarbon-contaminated sediments, and/or mercury.	1, 2, 3, 4, 5	**HAZMAT-B: Test sediment in the construction area to determine mercury concentrations in surficial sediments exposed by dredging and vegetation removal.** The District or construction contractor shall conduct soil testing for mercury in the areas proposed for vegetation/root mass removal, dredging, lowering of the weir, and other flood protection improvement activities. Soil and sediments shall be analyzed to ensure that potentially contaminated materials (e.g., soils containing elevated mercury concentrations) are handled, transported, and disposed of in accordance with applicable regulatory agencies' requirements.	See above	See above	See above	See above
Potential to mobilize, transport, and deposit asbestos, hydrocarbon-contaminated sediments, and/or mercury.	1, 2, 3, 4, 5	**WQ-A.** See above **WQ-B.** See above				
Air Quality						
Project-generated, short-term construction-related criteria air pollutant and precursor emissions.	BMP AQ - 1, 2, 3, 4~~, 5~~	~~**AQ-A: Control measures for short-term construction-generated emissions.**~~ ~~The following Basic Control Measures shall be implemented at all construction sites within the Project area, regardless of size.~~ ~~– The District, or its contractor, shall water all active construction areas at least twice daily;~~ ~~– The District, or its contractor, shall cover all trucks hauling soil, sand, and other loose~~	Monthly~~Weekly report during construction identifying incidents and corrective actions.~~	During construction (daily).	District or its designated construction contractor	~~BAAQMD~~

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		~~materials or require all trucks to maintain at least two ft (0.6 m) of freeboard;~~ ~~– The District, or its contractor, shall pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites;~~ ~~– The District, or its contractor, shall sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites;~~ ~~– The District, or its contractor, shall sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets;~~ ~~– Pursuant to BAAQMD Rule 6, the District shall ensure that emissions from all off-road diesel-powered equipment used on the Project site do not exceed 40 percent opacity for more than three minutes in any one hour. Any equipment found to exceed 40 percent opacity (or Ringelmann 2.0) shall be repaired immediately, and the District and BAAQMD shall be notified within 48 hours of identification of noncompliant equipment. A visual survey of all in-operation equipment shall be made at least weekly, and a monthly summary of the visual survey results shall be submitted throughout the duration of the Project to the District, except that the monthly summary shall not be required for any 30-day period in which no construction activity occurs. The monthly summary shall include the quantity and type of vehicles surveyed as well as the dates of each survey. BAAQMD and/or other officials may conduct periodic site inspections to determine compliance;~~				

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		~~– The District shall provide a plan for approval by BAAQMD demonstrating that the heavy-duty (more than 50 horsepower) off road vehicles to be used in the construction Project, including owned, leased, and subcontractor vehicles, would achieve a Project-wide fleet average 45 percent particulate reduction compared to the most recent CARB fleet average. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, alternative fuels (e.g., Lubrizol, Puri NO_x, biodiesel fuel) in all heavy duty off-road equipment;~~ ~~– The District shall require in construction plans and specifications that the model year of all off-road construction moving equipment shall not be older than 1996;~~ ~~– The District shall require in construction plans and specifications a provision that prohibits contractors from operating pre-1996 heavy-duty diesel equipment on forecast Spare-the-Air Days or on days when air quality advisories are issued because of special circumstances (e.g., wildfires, industrial fires); and~~ ~~– The District shall minimize idling time to 10 minutes for all heavy-duty equipment when not engaged in work activities, including on-road haul trucks while being loaded or unloaded on-site.~~ ~~The following Enhanced Measures shall be implemented at construction sites larger than four acres:~~ ~~– The District, or its contractor, shall hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously disturbed areas~~				

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		~~inactive for 10 days or more) – as appropriate;~~ ~~– The District, or its contractor, shall enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles that are not being actively turned for drying;~~ ~~– The District, or its contractor, shall limit traffic speeds on unpaved roads to 15 mph;~~ ~~– The District, or its contractor, shall install sandbags or other erosion control measures to prevent silt runoff to public roadways;~~ ~~– The District, or its contractor, shall replant vegetation in disturbed areas as quickly as possible; and~~ ~~– The District, or its contractor, shall install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site.~~ ~~These additional "Optional Measures" shall be implemented if further emission reductions are deemed necessary by the BAAQMD:~~ ~~– The District, or its contractor, shall suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph; and~~ ~~– The District, or its contractor, shall limit the area subject to excavation, grading and other construction activity at any one time.~~				
Potential exposure of sensitive receptors to TAC emissions.	1, 2, 3, 4, 5	~~AQ-A. See above~~ **AQ-B: Health and Safety Plan.** The District and/or its contractors shall prepare a Health and Safety Plan that includes Project-specific monitoring procedures and action levels for dust. The portion of the plan that relates to the control of toxic contaminants contained in fugitive	~~See above~~ In accordance with the District's Health and Safety Plan, file weekly report during construction identifying incidents	~~See above~~ Prepare plan prior to construction; implement plan during construction.	~~See above~~ District or its designated Construction contractor	~~See above~~ District, BAAQMD

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		dust shall be prepared in coordination with BAAQMD. The recommendations of BAAQMD to prevent the exposure of sensitive receptors to levels above applicable thresholds (probability of contracting cancer for MEI that exceeds 10 in one million or if ground level concentrations of non-carcinogenic contaminants result in hazard index greater than one for the MEI) shall be implemented. The Health and Safety Plan, applicable to all excavation activities, shall establish policies and procedures to protect workers and the public from potential hazards posed by hazardous materials. The plan shall be prepared according to federal and California OSHA regulations. The landowners and/or its contractors shall maintain a copy of the Plan on-site during construction activities.	and corrective actions.			
Noise						
On-Site, Off-Road, Heavy-Duty Equipment Noise Levels.	1, 2, 3, 4, 5	**NOI-A: Manage Construction Noise** – Construction equipment shall be properly maintained and equipped with noise controls, such as mufflers, in accordance with manufacturers' specifications. Equipment shall be inspected by Caltrans or a certified heavy equipment mechanic. A detailed list of on-site heavy equipment shall be compiled with noise control devices called out for each individual piece of heavy equipment. The inspection findings shall be presented in report format outlining existing control devices and noise control devices required to comply with this mitigation measure. Inspections shall be conducted prior to commencement of construction activities for each construction season with additional inspections to be	None	During construction (daily implementation).	District and/or its designated construction contractor	District

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		conducted mid way through the construction season. – All construction operations associated with the Project shall be limited to the hours of 8 a.m. to 5 p.m. Monday though Friday (or as prescribed by the City of San Jose), during which time such activities would have the least potential for annoyance or sleep disturbance. – Noise level measurements shall be conducted at sensitive receptor locations during construction activities to ensure compliance with the performance standards specified in Table 3.9-7 [of this EIR]. Noise level measurements shall be conducted by a qualified acoustical consultant during the first week of construction activities, specifically while Aquamogs, harvestors, front-end loaders, and haul trucks are operating during a typical work day. Additional noise level measurements shall be conducted prior to commencement of construction activities for each construction season with additional inspections to be conducted mid way through the construction season. If construction activities as measured exceed the City of San Jose Municipal Code for maximum exterior noise levels, the mitigation measures below shall be included as part of the project. – The initial construction activities shall not be conducted within 425 (distance to the 55 dBA contour due to proposed project construction noise as shown in Appendix E [of this EIR]) feet of any noise-sensitive receptor without the use of a temporary barrier. Provided that a temporary barrier is constructed, it would be required to be constructed in accordance with the following specifications:				

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		• The barrier shall be placed as close to the noise source or as close to the receptor as possible and shall break the line of sight between the source and receptor. • The barrier shall be 6 feet in height or break line of sight from receptor to source and shall extend 12 feet past the noise sensitive land uses, north and south, in order to reduce noise flanking around the barrier. Specifically, the construction area north and south of the SBYC and the land use located at the corner of Taylor and Hope Streets. • The barrier shall be constructed of ¾-inch Medium Density Overlay (MDO) plywood sheeting, or other acceptable material having a surface weight of two pounds per square foot (lb/sq.ft.) or greater, and a demonstrated Sound Transmission Class (STC) rating of 25 or greater as defined by the American Society for Testing and Materials (ASTM) Test Method E90. • For a temporary acoustical curtain, the material shall be weather and abuse resistance, and exhibit superior hanging and tear strength during construction and with a surface weight of at least one lb/sq.ft. The material shall have a minimum breaking strength of 120 pounds per inch (lb/in) per Federal Test Method Standard (FTMS) 191 A-M5102 and minimum tear strength of 30 lb/in per ASTM D117. Based on the same test procedures, the absorptive material facing shall have a minimum breaking strength of 100 lb/in and minimum tear strength of 7 lb/in. The material shall have a STC rating of 25 or greater, based on				

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		certified sound transmission loss data taken according to ASTM Test Method E90. It shall also have a Noise Reduction Coefficient (NRC) rating of 0.70 or greater, based on certified sound absorption coefficient data according to ASTM Test Method C423. • When barrier units are joined together, the mating surfaces of the barrier sides shall be flush with each other. Gaps between barrier units, and between the bottom edge of the barrier panels and the ground, shall be closed with material that will completely close the gaps, and be dense enough to attenuate noise.				
On-Site, Off-Road, Heavy-Duty Equipment Noise Levels.	1, 2, 3, 4, 5	**NOI-B: Manage Pile Driving Noise** – Holes shall be predrilled to the maximum feasible depth. This predrilling will reduce the number of blows required to seat the pile, and will concentrate the pile-driving activity closer to the ground where noise can be attenuated more effectively. – A noise disturbance coordinator shall be designated, and this person's telephone number shall be conspicuously posted around the project site and in adjacent public spaces. The noise disturbance coordinator shall receive all public complaints about construction-related noise and vibration, shall be responsible for determining the cause of the complaint, and shall implement any feasible measures (e.g., sensitive receptor façade upgrades, such as window package) to be taken to alleviate the problem. Complaints received shall be compiled in a monthly report outlining the nature of the complaint, the complainant, and location of disturbance, to be filed with the District.	Monthly reports during construction of any pile-driving work.	During construction (daily implementation)	District or its designated construction contractor	District

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
Off-Site, On-Road Vehicle Noise.	BMP NOI - 1, 2~~,~~ ~~3, 4, 5~~	~~**NOI-C: Manage Off-Site, On-Road Vehicle Noise**~~ – All heavy trucks shall be equipped with noise control (e.g., mufflers) devices in accordance with manufacturers' specifications. ~~– All heavy trucks shall be inspected periodically to ensure proper maintenance and presence of noise control devices (e.g., lubrication, non-leaking mufflers, and shrouding).~~ – All heavy trucks should maintain travel speeds of 25 mph along roadways with adjacent noise-sensitive receptors in the community of Alviso.	Monthly ~~Weekly reports during construction.~~	During construction (daily implementation).	District or its designated construction contractor	District
Exposure to Groundborne Vibration.	1, 2, 3, 4, 5	**NOI-D: Reduce Groundborne Vibration.** Pile driving shall be conducted as far as practicable from residential and historical structures. – Vibration monitoring equipment shall be placed at the property lines adjacent to pile driving activities, with owner approval. – Vibration monitoring shall be conducted by a qualified acoustical consultant and conducted upon commencement of pile driving. The results of the vibration monitoring shall be compiled in report format and filed with the District. Pile driving is considered short term and would only require vibration monitoring during a single site visit. – A pre- and post-construction survey shall be conducted to assess potential architectural damage from pile driving at residential and historical property lines. The survey shall include visual inspection of the structure, documentation of the structure by means of photographs and video. This documentation shall be reviewed with the individual owner	A report on the results of vibration monitoring. A report on the findings of the pre- and post-construction survey for architectural damage.	During construction (vibration monitoring). Pre- and post-construction (survey to assess potential architectural damage)	District and/or its designated construction contractor	District

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		prior to any construction activity. Post-construction monitoring of the structure shall be performed to identify (and repair, if necessary) damage, if any, from construction vibrations. Any damage shall be documented with photographs and video. This documentation shall also be reviewed with the individual property owners. – Pile driving, or pre-drilling shall not occur during outside the daytime hours (i.e., 8 a.m. to 5 p.m. Monday through Friday)				
Land Use and Planning						
Short-term construction related land use conflict.	1, 2, 3, 4, 5	**LU-A. Notice to Residents and User Groups.** Prior to construction and maintenance activities, the District shall post notice of the upcoming activities, including construction location and duration. The notice shall be posted near the site, on the District web site and also sent to organizations and recreational use groups prior to construction and maintenance activities. It shall also be made available to the USFWS, Santa Clara County Parks and Recreation Department and City of San Jose for posting on their websites.	None	Notice sent prior to construction.	District	District
Recreation						
Loss of recreational opportunities or access, or degradation in recreational experiences due to construction.	1, 2, 3, 4, 5	**REC-A: Alternate recreational trail route signage.** During construction, or whenever an existing recreational trail is closed off due to project construction related activities, the District shall post signage indicating an alternative route around the construction area. For all trails within City of San Jose jurisdiction, closures must be coordinated with the City's Trail Program Manager. If	None	Signage posted daily during construction.	District	District

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		construction occurs during the hunting season, additional signs shall be posted near the construction site marking appropriate access and parking locations for hunters.				
Cultural and Historic Resources						
Impacts to As-Yet Unknown Cultural Resources including human remains.	1, 2, 3, 4, 5	**CUL-A: Preconstruction Worker Education and Consultation if Resources are Encountered.** If evidence of archaeological or historic-era resources is uncovered during Project construction, work in the vicinity of the find shall be halted until the discovery can be evaluated and treated. Before the start of construction activities or ground disturbing activities associated with the project, a professional archaeologist who meets the Secretary of the Interior's Standards and Qualifications shall alert all construction personnel to the possibility of finding buried cultural resources during subsurface excavation. If artifacts or unusual amounts of stone, bone, or shell are uncovered during construction activities, work within 50 feet of the specific location at which the suspected resources have been uncovered shall be suspended, and the District shall be immediately contacted. At that time, the District shall retain a professional archaeological consultant who meets the Secretary of the Interior's Standards and Qualifications who shall conduct a field investigation of the specific site and recommend mitigation deemed necessary for the protection or recovery of any cultural resources concluded by the archaeologist to represent significant or potentially significant resources (as defined by CEQA). If the cultural resource is determined to be a historic property as defined by the NHPA, potential adverse effects resulting from the proposed Project shall be resolved in consultation between SHPO, the ACHP,	Report prior to the start of construction on worker education techniques and schedule of training dates; Prepare report following completion of worker training.	Prior to and During construction (daily implementation)	District or its designated qualified archaeologist	District

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		and interested parties. The lead agency shall ensure that the mitigation is implemented before the resumption of construction activities at the location of the find.				
Impacts to As-Yet Unknown Cultural Resources including human remains.	1, 2, 3, 4, 5	**CUL-B: Stop Work If Human Remains are Uncovered.** If evidence of human remains is uncovered during Project construction, work in the vicinity of the find shall be halted until the burials can be evaluated and treated. In accordance with the California Health and Safety Code, if human remains are uncovered during ground-disturbing activities, the contractor shall immediately halt potentially damaging excavation within 50 feet of the burial and notify the District; the District shall notify the Santa Clara County Coroner and a professional archaeologist to determine the nature of the remains. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or state lands (Health and Safety Code Section 7050.5[b]). If the coroner determines that the remains are those of a Native American, he or she must contact the Native American Heritage Commission (NAHC) by phone within 24 hours of making that determination (Health and Safety Code Section 7050[c]). Following the coroner's findings, the property owner, contractor or Project proponent, an archaeologist, and the NAHC-designated Most Likely Descendent (MLD) shall determine the ultimate treatment and disposition of the remains and take appropriate steps to ensure that additional human interments are not disturbed. The responsibilities for acting upon notification of a discovery of Native American human remains are	Report summarizing evidence of human remains and proactive solution for construction, to be prepared immediately following incident.	During construction (daily implementation)	District or its designated qualified archaeologist	District, County Coroner

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		identified in California Public Resources Code Section (PRC) 5097.9. Upon the discovery of Native American remains, the landowner shall ensure that the immediate vicinity (according to generally accepted cultural or archaeological standards and practices) is not damaged or disturbed by further development activity until consultation with the MLD has taken place. The MLD shall have 48 hours to complete a site inspection and make recommendations after being granted access to the site. A range of possible treatments for the remains, including nondestructive removal and analysis, preservation in place, relinquishment of the remains and associated items to the descendents, or other culturally appropriate treatment may be discussed. PRC 5097.9 suggests that the concerned parties may extend discussions beyond the initial 48 hours to allow for the discovery of additional remains. The following is a list of site protection measures that the landowner shall employ: (1) Record the site with the NAHC or the appropriate Information Center (2) Utilize an open-space or conservation zoning designation or easement (3) Record a document with the county in which the property is located The landowner or their authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance if the NAHC is unable to identify a MLD or the MLD fails to make a recommendation within 48 hours after being granted access to the site. The landowner or				

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		their authorized representative may also re-inter the remains in a location not subject to further disturbance if they reject the recommendation of the MLD, and mediation by the NAHC fails to provide measures acceptable to the landowner. Adherence to these procedures and other provisions of the California Health and Safety Code will reduce potential impacts to human remains to a less-than-significant level.				
Transportation and Traffic						
Short-term degradation of traffic levels on a roadway or at an intersection due to haul truck traffic.	1, 2, 3, 4, 5	**TRANS-A: Timing of construction related truck trips.** All Project haul truck traffic shall be limited to between the hours of 9:00 a.m. and ~~4:30 p.m~~ 3:30 p.m. In addition, the Project shall conform to the City's Traffic Control policies, and the Project applicant shall obtain a Haul Route Permit and, if needed, an Encroachment Permit.	Monthly reports during construction.	During construction (daily implementation).	District	Caltrans, San Jose Department of Public Works
~~Addition of haul truck traffic on sections of the San Francisco Bay Trail.~~	~~1, 2, 3, 4, 5~~	~~**TRANS-B: Courtesy updates on construction activities.**~~ ~~Prior to initiating any significant hauling operations using existing or proposed Bay Trail segments, the District shall inform the Bay Trail Program Mangers; the City of San Jose Department of Parks, Recreation, and Neighborhood Services; and the Santa Clara County Department of Parks and Recreation.~~	~~Monthly reports during construction.~~	~~Prior to and during construction, as appropriate.~~	~~District~~	~~San Jose Department of Public Works~~
Increase in wear and tear on the designated haul routes during construction.	1, 2, 3, 4, 5	**TRANS-C: Videotaping of Road Conditions.** As local or residential streets are part of the designated haul route for the Alviso Slough Restoration Project, the District shall prepare a videotape of road conditions prior to the start-up of Project related activities for the residential streets affected by the Project. The District shall prepare a	Report summarizing pre- and post-construction conditions.	Prior to and Post-Construction. Roadway rehabilitation plan prepared within 6 months of post-	District	San Jose Department of Public Works

Alviso Slough Restoration Project
Mitigation Monitoring and Reporting Program

Environmental Impact Issue	Applicability (Alternative(s))	Mitigation Measure	Reporting Need & Timeframe	Implementation Timeframe	Implementation Responsibility	Oversight Responsibility
		similar videotape of road conditions after vegetation/root mass removal and dredging of sediments and hauling of these materials to nearby landfill facilities are completed. The pre- and post-construction conditions of haul routes shall be reviewed by staff of the City of San Jose Public Works Department and permits from Caltrans shall be obtained. An agreement shall be entered into prior to Project related activities that will detail the pre-Project conditions and post-Project requirements of a roadway rehabilitation program.		construction videotape.		
Roadway safety hazards associated with haul truck traffic exiting/entering staging areas.	1, 2, 3, 4, 5	**TRANS-D: Use of safety signage and flagpersons at key locations.** The District or its designated construction contractor shall employ the use of safety related signage and flagpersons at key locations near staging area entrances and exits, in order to ensure safe passage through these areas by all users.	Monthly	During construction.	District or its designated construction contractor	San Jose Department of Public Works
Public Services						
No Mitigation Measures Required.						
Utilities						
No Mitigation Measures Required.						
Aesthetics						
No Mitigation Measures Required.						
Social and Economic Effects, including Environmental Justice						
No Mitigation Measures Required.						

This page intentionally left blank.

6 List of Preparers & Reviewers

6.1 SANTA CLARA VALLEY WATER DISTRICT

The following staff members assisted in the planning, preparation and/or review of the EIR and associated technical studies:

Name	Title	Project Role
Katherine Oven, PE	Deputy Operating Officer - Capital Program Services Division	Project Oversight and District Management Representative
Bal Ganjoo, PE	Engineer/Senior Project Manager	Senior Project Manager, Engineer
Mike Coleman, AICP	Environmental Planner	Planner of Record
Al Gurevich	Engineering Unit Manager	
Javier Valencia	Assistant Engineer	Assistant Engineer
Doug Titus	Biologist	Project Lead Biologist
David Dunlap	Senior Environmental Planner	QC and Technical Support
Terry Neudorf	Senior Environmental Planner	QC
Michael Martin	Environmental Planner	QC
Beth Dyer	Senior Project Manager	QC Reviewer for South Bay Salt Ponds
Debra Caldon	Unit Manager, Environmental Planning Unit	QC and Management Support, Findings and Statement of Overriding Considerations
Peggy Oman	Project Coordinator	Project Support
Karen Akiyama	Project Coordinator	Project Support
Tiffany Hernandez	Environmental Planner/Biologist	Reviewer, Fisheries
Melissa Moore	Biologist	Reviewer, Fisheries
David Salsbury	Biologist	Reviewer, Fisheries

6.2 EIR AND ENGINEERING CONSULTANT TEAM

The consulting firm of EDAW | AECOM led the preparation of this EIR in coordination with Philip Williams & Associates, Ltd., H.T. Harvey & Associates, Brown and Caldwell, and Geotechnical Consulting, Inc.

EDAW | AECOM

Name	Title	Project Role
Mark Winsor, Ph.D.	Principal In Charge	Principal In Charge
Marcia Tobin	Senior Environmental Planner	Problem Definition, Final EIR
Elke Rank, AICP	Project Manager	Project Description, Purpose and Need, Project Alternatives, Problem Definition
Suet Chau	Project Manager, Environmental Planner	Cumulative Impacts
Susan Yogi	Environmental Planner	Public Services, Utilities, Population & Housing
Rudy Calderon	Environmental Planner	Transportation and Traffic
Chris Fitzer	Fisheries Biologist	Aquatic Biology
David Epstein	Biologist	Aquatic Biology
Chris Shields	Noise Analyst	Noise

Name	Title	Project Role
Jim Vogel	Recreation Planner	Recreation
Josh Hohn, AICP	Land Use Planner	Land Use, Aesthetics
Jeremy Siew	Visualization Specialist	Visual Resources
Charlane Gross	Senior Archaeologist	Cultural Resources
Honey Walters	Senior Air Quality Specialist	Air Quality
Kara Demsey	Environmental Engineer	Project Description, Final EIR
Alexander Quinn	Senior Economic Planner	Socioeconomics
Kimberly Christensen	Senior Environmental Planner	Socioeconomics, Environmental Justice
Erin Camerena	Planner	Socioeconomics, Environmental Justice
Lynn Frederico	GIS Specialist	GIS/Graphics
Lynn Alexander, AICP	Senior Environmental Planner	Final EIR

Philip Williams & Associates. Ltd. (PWA)

Name	Title	Project Role
Michelle Orr, P.E.	Principal Engineer	Operations and Maintenance
Nick Garrity	Senior Hydrologist	Hydrology and Geomorphology; Sedimentation
Justin Vandever	Hydrologist	Hydrology and Geomorphology; Sedimentation

H.T. Harvey & Associates (HTH)

Name	Title	Project Role
Ron Duke	President, Wildlife Ecologist	Principal In Charge
Patrick Boursier	Principal	Regulatory Specialist
John Bourgeois	Project Manager; Wetland Ecologist	Terrestrial Biology; Project Description, Project Alternatives
Laura Bauman	Wetland Ecologist	Terrestrial Biology
Amanda Breen	Botanist	Terrestrial Biology

Brown and Caldwell (BC)

Name	Title	Project Role
Laura Marshall, P.E.	Senior Engineer	Water and Sediment Quality; Project Description
Khalil Abusaba, Ph.D.	Principal Scientist	Water and Sediment Quality; Project Alternatives
Emily Moshier	Engineer II	Water and Sediment Quality
Bryan Plude, P.E.	Supervising Engineer	Project Description
Mike Flake, P.E.	Supervising Engineer	Project Description

Geotechnical Consultants, Inc. (GTC)

Name	Title	Project Role
James Thurber	California Registered Geologist, Certified Engineering Geologist	Geology and Soils

6.3 OTHER CONSULTANTS

Alviso Slough Restoration Project Meeting Facilitation Consultant

Name	Title	Project Role
Mary Ann Ruiz	Public Participation Specialist	Independent meeting Facilitator

Alviso Slough Independent Advisory Panel - Recreation

Name	Title	Project Role
Mike Sherrod, RRM Design Group	Recreation Planner	Independent Advisory Panel
Tammy Seale, PMC	Recreation Planner	Independent Advisory Panel
Chris Cruz, West Valley-Mission Community College District	Recreation Planner	Independent Advisory Panel

Alviso Slough Independent Advisory Panel - Fisheries

Name	Title	Project Role
Chris Kitting, Ph.D., CSU East Bay	Aquatic/Fisheries Biologist	Independent Advisory Panel
Jeff Kozlowski, JSA	Aquatic/Fisheries Biologist	Independent Advisory Panel
Thomas Taylor, Entrix	Aquatic/Fisheries Biologist	Independent Advisory Panel

This page intentionally left blank.

7 References

References are provided here, organized by section (Chapter 2.0, and Sections 3-1 through 3-18).

(2.0) Description of the Alternatives

Burrill, R. and L. Rodgers. (2006). Images of America - Alviso, San Jose, Arcadia Publishing, Charleston, SC.

(3.1) Hydrology and Geomorphology

Brown and Caldwell, PWA, et al. (2005). Moffett Field Storm Water Retention Pond Tidal Restoration Feasibility Study, Prepared for NASA Ames Research Center.

Cheng, R. T. and J. W. Gartner (1985). "Harmonic analysis of tides and tidal currents in South San Francisco Bay, California." Estuarine, Coastal, and Shelf Science **21**: p57-74.

Cloern, J., T. Powell, et al. (1989). "Spatial and temporal variability in South San Francisco Bay (USA). 2. Temporal changes in salinity, suspended sediments, and phytoplankton biomass and productivity over tidal time scales." Estuarine, Coastal and Shelf Science **28**(6): 599-613.

EDAW, PWA, et al. (2008). Alviso Slough Restoration Project: Engineer's Report. In preparation for: Santa Clara Valley Water District.

Foxgrover, A. C., S. A. Higgins, et al. (2004). Deposition, erosion, and bathymetric change in South San Francisco Bay: 1858-1983., U.S. Geologic Survey Open-File Report 2004-1192: 25.

Krone, R. B. (1996). Recent Sedimentation in the San Francisco Bay System. San Francisco Bay: The Ecosystem. J. T. Hollibaugh, Pacific Division of the American Association for the Advancement of Science.

Life Science (2003). South Bay Salt Ponds Initial Stewardship Plan, Prepared for U.S. Fish and Wildlife Service and California Department of Fish and Game.

May, C., J. Koseff, et al. (2003). "Effects of spatial and temporal variability of turbidity on phytoplankton blooms." Marine Ecology-Progress Series **254**: 111-128.

McKee, L., N. Ganju, et al. (2002). Estimates of suspended-sediment flux entering San Francisco Bay from the Sacramento and San Joaquin Delta, San Francisco Estuary Insitutute: 28.

McKee, L., J. Leatherbarrow, et al. (2004). Concentrations and Loads of Mercury, PCBs, and OC Pesticides Associated with Suspended Sediments in the Lower Guadalupe River, San Jose, California. A Technical Report of the Regional Watershed Program: SFEI Contribution #86. San Francisco Estuary Institute. Oakland, CA: 83.

Northwest Hydraulic Consultants (2002). Final Reconnaissance Report: Engineering and Environmental Reconnaissance Studies of the River Reach from UPRR to the Bay. Lower Guadalupe River Project.

Ogden Beeman & Associates and Ray B. Krone & Associates (1992). Sediment Budget for San Francisco Bay: 25 pp.

Powell, T., J. Cloern, et al. (1989). "Spatial and temporal variability in South San Francisco Bay (USA). 1. Horizontal distributions of salinity, suspended sediments, and phytoplankton biomass and productivity." Estuarine Coastal and Shelf Science **28**(6): 583-597.

PWA (1987). Hydrologic Factors in the Palo Alto Yacht Harbor Restoration.

PWA (2006). Flood Analyses Report. San Francisco, Prepared for: California State Coastal Conservancy, U.S. Fish and Wildlife Service, California Department of Fish and Game: 60.

PWA (2007). Appendix G-5. Alviso Pond A8 Hydrodynamic Modeling and Geomorphic Analysis. In: EDAW et al. 2007. South Bay Salt Pond Restoration Project EIS/R Public Draft. Prepared for U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and California Department of Fish and Game. March 2007. San Francisco, CA.

PWA 2007. Technical memorandum re: Alviso Slough Restoration Project, Task 7.2: Sedimentation and Hydraulic Geometry Analysis. October 16, 2007 - revised January 14, 2008;

PWA (2007). A Conceptual Model of the Evolution of Alviso Slough. San Francisco, CA.

PWA, H. T. Harvey & Associates, et al. (2005). Hydrodynamics and Sediment Dynamics Existing Conditions Report. San Francisco, CA., Prepared for: California State Coastal Conservancy, U.S. Fish and Wildlife Service, California Department of Fish and Game.

PWA and Phyllis Faber & Associates (2003). Monitoring the Evolution of Restored Tidal Marshes in San Francisco Bay: Physical and Vegetation Monitoring Data For Warm Springs, Muzzi, & China Camp Marshes from 1981 to 2003, Prepared for The Bay Institute.

Ruth and Going Inc., Cooper-Clark Associates, et al. (1980). Causes of Sedimentation at Santa Clara County Marina, Alviso and Remedial Measures. Draft Report, Prepared for the County of Santa Clara.

Santa Clara Valley Water District (2001). Lower Guadalupe River Planning Study: Engineers Report.

Santa Clara Valley Water District (2003). Watershed Characteristics Report, Santa Clara Valley Water District (SCVWD).

SCVWD and USACE (U.S. Army Corp of Engineers, Sacramento District), 2006. Guadalupe River Project: Final Operations, Maintenance, Repair, Replacement, & Rehabilitation Manual, San Jose, Santa Clara County, California. Prepared by URS, December 14.

Schaaf & Wheeler (2004). Alviso Slough Tidal Prism Enhancement Project Draft Technical Report. Santa Clara, California, Santa Clara Valley Water District.

Schoellhamer, D. (1996). "Factors affecting suspended-solids concentrations in South San Francisco Bay, California." Journal of Geophysical Research - Oceans **101**(C5): 12087-12095.

SCVWD (2007). UNET Analyses of Alternatives 1-5. Alviso Slough Restoration Project. September 20, 2007.

Tudor Engineering Company (1973). Baylands Salt Water Flood Control Planning Study, Tudor Engineering Company.

U.S. Army Corps of Engineers (1984). San Francisco Bay: Tidal Stage vs. Frequency Study. San Francisco District.

U.S. Army Corps of Engineers (1988). San Francisco Bay Shoreline Study: Southern Alameda and Santa Clara Counties, interim, U.S. Army Corps of Engineers.

URS (2002). Proposed SFO Runway Reconfiguration Project, Predicted changes in hydrodynamics, sediment transport, water quality, and aquatic biotic communities associated with SFO runway reconfiguration. Alternative BX-6, Prepared for the City and County of San Francisco and the Federal Aviation Administration.

Walters, R.A., R.T. Cheng, T.J. Conomos. (1985). "Time scales of circulation and mixing processes of San Francisco Bay waters. *Hydrobiologia*. Vol. 129. pp. 13-36.

Watson, E. B. (2004). "Changing elevation, accretion, and tidal marsh plant assemblages in South San Francisco Bay tidal marsh." Estuaries **27**(4): 684-698.

Williams, P. B., M. K. Orr, et al. (2002). "Hydraulic geometry: A geomorphic design tool for tidal marsh channel evolution in wetland restoration projects." Restoration Ecology **10**(3): 577-590.

Wright, S. A. and D. H. Schoellhamer (2004). "Trends in the Sediment Yield of the Sacramento River, California, 1957 - 2001." San Francisco Estuary and Watershed Science **2**(2).

(3.2) Water and Sediment Quality

Abu-Saba, K. and Ogle, S., 2005. Selenium in San Francisco Bay, Conceptual Model/Impairment Assessment. Final Report.

Abusaba, K.E. and Tang, L, 2000. Watershed Management of Mercury in the San Francisco Bay Estuary: a TMDL Report to USEPA. Report presented to the San Francisco Bay Regional Water Quality Control Board, June 2000, Oakland California. Available for downloads at http://www.swrcb.ca.gov/rwqcb2/download/aug00HgTMDL.pdf.

Andersen, D.W., 1998. Natural Levels of Nickel, Selenium, and Arsenic in the Southern San Francisco Bay Area, San Jose State University, Institute for Research in Environmental Engineering and Science, San Jose, CA.

Applied Marine Sciences, 2004. Analysis of Pollutants in Sediment Cores Near Storm Water Inputs – Final Report. Prepared for the San Francisco Bay Clean Estuary Partnership. Oakland, California, July, 2004. www.cleanestuary.com.

Applied Marine Sciences, 2005. Existing data on PCB concentrations of Near shore Sediments and Assessment of Data Quality. Prepared for the Clean Estuary Partnership, Oakland, California. www.cleanestuary.com.

Brown and Caldwell, 2004. Mercury Technical Memorandum, South Bay Salt Pond Restoration Project, Prepared for: California State Coastal Conservancy, U.S. Fish and Wildlife Service, California Department of Fish and Game, San Francisco, CA.

Brown and Caldwell, 2006. South Bay Salt Ponds Restoration Project Nutrients and Contaminant Analysis Report, California State Coastal Conservancy, Walnut Creek, California.

Brown and Caldwell, 2008. Pond A8 Phase 1 Action Mercury Strategy Technical Memorandum, Prepared for: South Bay Salt Pond Restoration Project Management Team.

Conaway, C.H., Watson, E., Flanders J.R., and Flegal, A.R., 2003. Mercury deposition in a tidal marsh downstream of the historic New Almaden Mining District, California. Journal de Physique IV – Proceedings, 107:1421.

Conaway. C.H., Watson, E., Flanders, J.R., and Flegal, A.R., 2004. Mercury Deposition in a San Francisco Estuary Tidal Marsh. Materials and Geoenvironment, 51, 51-52.

Conaway, C.H., 2005. Sources, Fate and Transport of Mercury in San Francisco Bay Estuary and its Tributaries. Ph.D. Dissertation in Environmental Toxicology, University of California, Santa Cruz.

Connor, M., Davis, J., Leatherbarrow, J. and Werme, C., 2004. Legacy Pesticides in San Francisco Bay. Conceptual Model/Impairment Assessment. Final Report.

Davis, 2004. The Long-Term Fate Of Polychlorinated Biphenyls In San Francisco Bay (USA) Environmental Toxicology and Chemistry, 23: 2396-2409.

Davis, J.A., Hetzel, F., and Oram, J., 2006. PCBs in San Francisco Bay: Impairment Assessment / Conceptual Model Report. Prepared for the Clean Estuary Partnership. Oakland, California, February, 2006. www.cleanestuary.com..

Earth Tech, 2006. Phase 1 Hazardous Substance Liability Assessment, Santa Clara Valley Water District, San Jose, California.

Grenier, L. , Robinson, A., Bezalel, S., Hunt, J., Melwani, A., Collins, J., Marvin-DiPasquale, M., and Drury, D. South Baylands Mercury Project 2007 Year-End Progress Report. January, 2007. San Francisco Estuary Institute, Oakland California.

Johnson, B.L., 1999. The role of adaptive management as an operational approach for resource management agencies. Conservation Ecology, 3(2): 8.

Kleinfelder, 2001. Final Report – Level II Hazardous Materials Investigation, Lower Guadalupe River Flood Control Project, San Jose, Santa Clara County, California., Santa Clara Valley Water District, Oakland, California.

Marvin-Dipasquale, M. and Cox, M, 2007. Legacy Mercury in Alviso Slough, South San Francisco Bay, California: Concentration, Speciation and Mobility. USGS Open file report 2007-1240. http://pubs.usgs.gov/of/2007/1240/

McKee, L. et al., 2006. Concentrations and Loads of Mercury, PCBs, and PBDEs in the Lower Guadalupe River, San Jose, California: Water Years 2003, 2004, and 2005. A Technical Report of the Regional Watershed Program: SFEI Contribution #424. San Francisco Estuary Institute, Oakland, CA.

Phillip Williams and Associates, 2006. South Bay Salt Ponds Restoration Project: Final Alternatives Report, California State Coastal Conservancy, San Francisco, California.

San Francisco Bay Regional Water Quality Control Board, 2000. DRAFT Staff Report - Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines. Oakland, California, May, 2000. http://www.waterboards.ca.gov/sanfranciscobay/download/benreuse.pdf.

San Francisco Bay Regional Water Quality Control Board, 2002. Staff Report On Proposed Site-Specific Water Quality Objectives And Water Quality Attainment Strategy For Copper And Nickel For San Francisco Bay South Of The Dumbarton Bridge, Oakland, California.

San Francisco Bay Regional Water Quality Control Board, 2004. Mercury in San Francisco Bay: Total Maximum Daily Load (TMDL) and Proposed Basin Plan Amendment and Staff Report, California Environmental Protection Agency, Oakland, California.

San Francisco Bay Regional Water Quality Control Board, 2006. Mercury in San Francisco Bay Proposed Basin Plan Amendment and Staff Report for Revised Total Maximum Daily Load (TMDL) and Proposed Mercury Water Quality Objectives. August 1, 2006 Staff Report, available at: http://www.waterboards.ca.gov/sanfranciscobay/TMDL/SFBayMercury/sr080906.pdf

San Francisco Bay Regional Water Quality Control Board, 2007. Total Maximum Daily Load for PCBs in San Francisco Bay Proposed Basin Plan Amendment and Staff Report. June 22, 2007 Staff Report, available at: http://www.waterboards.ca.gov/sanfranciscobay/TMDL/SFBayPCBs/June%202007PCBsTMDLSR&BPAdraft.pdf

San Francisco Estuary Institute, 2006. The Pulse of the Estuary: Monitoring and Tracking Contaminants in the San Francisco Bay Estuary. SFEI Contribution Number 517, Oakland, California.

Santa Clara Valley Water District, 1994. Copper and selenium in the Water Supply of the Santa Clara Valley, San Jose, CA.

Singer, M.M. et al., 1998. Effects of Dispersant Treatment on the Acute Aquatic Toxicity of Petroleum Hydrocarbons. Archives of Environmental Contamination and Toxicology, 34: 177-187.

Takekawa, J.Y. et al., 2005. South Bay Salt Ponds Restoration Project Short-term Data Needs, 2003-2005. Unpublished Final Draft., U. S. Geological Survey, Vallejo, CA.

Tetra Tech, 2006b Conceptual Model of Mercury in San Francisco Bay. Prepared for the Clean Estuary Partnership. January, 2006, Lafayette, California www.cleanestuary.com.

Trulio, L. and Clark, D., 2006. South Bay Salt Ponds Restoration Project Adaptive Management Plan, California Coastal Conservancy, Oakland, California.

U.S. Army Corps of Engineers (USACE), 2008. Technical Guidelines for Environmental Dredging of Contaminated Sediments, Prepared for: U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response, Washington DC, September 2008.

U.S. Environmental Protection Agency, 2006. Draft Guidance for Implementing the Methylmercury Water Quality Criterion. EPA-823-B-04-001, Washington, D.C.

United States Environmental Protection Agency, 2004. Draft Aquatic Life Water Quality Criteria for Selenium - 2004. EPA-822-D-04-001, Washington, D.C.

Windham-Myers, L. and Marvin-Dipasquale, M. (2007), Direct and Indirect Effects of Vegetation on Methylmercury Production in Wetlands as Assessed by Experimental Plant Removal, Eos Trans. AGU, 88(52), Fall Meet. Suppl., Abstract B14B-04

Venkatesan, M.I., de Leon, R.P., van Geen, A., and Luoma, S.N., 1999. Chlorinated hydrocarbon pesticides and polychlorinated biphenyls in sediment cores from San Francisco Bay. Marine Chemistry, 64:85-97.

San Francisco Estuary Institute, 2002. Results of the Estuary Interface Pilot Study, 1996-1999. A Technical Report of the Sources Pathways and Loadings Work Group San Francisco Estuary Regional Monitoring Program for Trace Substances. Jon E. Leatherbarrow, Rainer Hoenicke, and Lester J. McKee (eds.) Report available at http://www.sfei.org/rmp/reports/eip/EIP_FINAL.pdf. Additional data collected through 2001 available for download at http://www.sfei.org/RMP/report. Websites last accessed 1/29/2008.

(3.3) Biological Resources Aquatic

Asplund, T. R. 2000. The effects of motorized watercraft on aquatic ecosystems. Wisconsin Department of Natural Resources, Bureau of Integrated Science Services and the University of Wisconsin, Madison Water Chemistry Program. Publication SS-948-00.

Baxter, R. K. Hieb, S. DeLeon, K. Fleming, and J. Orsi. 1999. *Report on the 1980–1995 fish, shrimp, and crab sampling in the San Francisco Estuary, California.* The Interagency Ecological Program for the Sacramento-San Joaquin Estuary. Technical Report 63. November 1999.

California Department of Fish and Game. 2005. Commercial fisheries information based on information from CDFG commercial fish landings.

California Research Bureau. 2002. *"Background Report on the Cargill Salt Ponds."* South Bay Salt Pond Restoration Project. Senate Select Committee on Baylands Acquisition, Thursday, June 20, 2002. http://www.southbayrestoration.org/Cargill%20background%20report.html Accessed on 12/18/2006.

Carlton J. T., J. Thompson, L. E. Schemel, and F. H. Nichols. 1990. Remarkable invasion of San Francisco Bay (California, USA) by the Asian clam *Potamocorbula amurensis* I. Introduction and dispersal. *Marine Ecol. Prog.* Series 66: 81–94.

Carpelan, L. H. (1957). "Hydrobiology of the Alviso salt ponds." *Ecology* 38(3): 375–390.

Choe, K. Y. and Gill, G. A. 2003. Distribution of particulate, colloidal, and dissolved mercury in San Francisco Bay estuary. 2. Monomethyl mercury. *Limnology and Oceanography* 48: 1547–1556.

Choe, K. Y., Gill, G. A., and Lehman, R. 2003. Distribution of particulate, colloidal, and dissolved mercury in San Francisco Bay estuary. 1. Total mercury. *Limnology and Oceanography* 48: 1535–1546.

Cohen, A. N. 2000. Biological invasions in coastal waters. *J. Shellfish Res.* 19(1): 630–631.

Coull, B. C. and G. T. Chandler. 1992. Pollution and meiofauna: field, laboratory, and mesocosm studies. *Oceanography and Marine Biology Annual Reviews* 30:191–271.

Davis, J., Yee, D., Collins, J., Schwarzbach, S., and Luoma, S. 2003. Potential for Increased Mercury Accumulation in the Estuary Food Web In: Larry R. Brown, editor. *Issues in San Francisco Estuary Tidal Wetlands Restoration. San Francisco Estuary and Watershed Science.* Vol. 1, Issue 1 (October 2003), Article 4.

Foe, C. 2002. *Mercury mass balance for the freshwater Sacramento-San Joaquin Bay-Delta Estuary.* Draft Final Report to the California Bay Delta Authority. Sacramento, CA.

Foe, C., M. Stephenson, and S. Stanish. 2003. Pilot Transplant Studies with the Introduced Asiatic Clam, Corbicula fluminea, to Measure Methyl Mercury Accumulation in the Sacramento-San Joaquin

Delta Estuary. In CALFED Final Report titled "*An Assessment of Human Health and Ecological Impacts of Mercury in the Bay-Delta Watershed.*"

Gill, G. A., Lehman, R., Choe, K. Y., and Han, S. 2002. *Sediment-water exchange and estuarine mixing fluxes in the San Francisco Bay-Delta watershed.* Draft Final Report to the California Bay Delta Authority. 139 pp.

Goals Project. 1999. *Baylands Ecosystem Habitat Goals.* A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. First Reprint. San Francisco, CA/Oakland, CA, U.S. Environmental Protection Agency/San Francisco Bay Regional Water Quality Control Board: 209.

H. T. Harvey & Associates. 2007. Figures originally prepared for: *Alviso Slough Restoration Project, Feasible Project Alternatives Technical Memorandum* (May 2007).

Hanson, C. H., Ph.D. 2004. *Assessment of Potential fishery Habitat Benefits/Adverse Effects of Proposed Vegetation Removal within Lower Alviso Slough.* Unpublished draft, January 2004. Hanson Environmental Inc.

Hedgecock, D., and Garcia-Rossi, D. 2002. *Provenance analysis of Chinook salmon* (Onchorynchus tshawytscha) *in Santa Clara valley watershed.* Bodega Marine Laboratory, University of California at Davis. Bodega Bay, CA.

Herbold, B., A. D. Jassby, and P. B. Moyle. 1992. *San Francisco Estuary Project: Status and trends report on aquatic resources in the San Francisco Estuary, March 1992.*

Heim, W. A., Coale, K., and Stephenson, M. 2003. *Methyl and total mercury spatial and temporal trends in surficial sediment of the San Francisco Bay-Delta.* Final Report to the California Bay Delta Authority.

Hilton, J. and Phillips, G. L. 1982. The effect of boat activity on turbidity in a shallow broadland river. Journal of Applied Ecology. 19:143-150.

Hirsch, N. D., L. H. DiSalvo, and R. Peddicord. 1978. *Effects of Dredging and Disposal on Aquatic Organisms*. Syn. Res. Results, Dred. Mat. Res. Prog., Tech. Rpt. DS-78-5. 41pp. Waterw. Exp. Stat., Vicksburg, MS. August.

Jones, A. and Slotton, D. 1996. *Mercury Effects, Sources, and Control Measures.* A Special Study of the San Francisco Estuary Regional Monitoring Program, San Francisco Estuary Institute. Richmond, CA.

Kimmerer W. J. 1998. *Zooplankton of San Francisco Bay: report of a pilot monitoring program.* Interagency Ecological Program Newsletter 11(2): 19–23

Kimmerer, W. 2002a. Physical, biological, and management responses to variable freshwater flow into the San Francisco estuary. *Estuaries* 25(6B): 1275–1290.

Kimmerer, W. 2002b. Effects of freshwater flow on abundance of estuarine organisms: physical effects or trophic linkages? *Marine Ecology Progress Series* 243: 39–55.

Krone, R. B. 1979. *Sedimentation in the San Francisco Bay system.* pp. 85–96 In San Francisco Bay - The Urbanized estuary. T.J. Conomos (ed). Am. Assoc. Adv. Sci., Pacific Division, San Francisco, CA.

(3.4) Biological Resources - Terrestrial

Accurso, L.M. 1992. Distribution and Abundance of Wintering Waterfowl on San Francisco Bay. Unpublished M.S. thesis, Humboldt State University, Arcata, CA.

Ackerman, J. T., C. A. Eagles-Smith, G. H. Heinz, S. E. Wainwright-De La Cruz, J. Y. Takekawa, T. L. Adelsbach, A. K. Miles, D. J. Hoffman, S. E. Schwarzbach, T. H. Suchanek, and T. C. Maurer. 2007a. Mercury in birds of the San Francisco Bay-Delta: trophic pathways, bioaccumulation and ecotoxicological risk to avian reproduction. Unpublished 2006 annual report, U. S. Geological Survey, Western Ecological Research Center, Davis, CA, and U. S. Fish and Wildlife Service, Environmental Contaminants Division, Sacramento, CA. 38 pp

Alberston JA, Evens. JG. 2000. California clapper rail (*Rallus longirostris obsoleuts*). In: Olofson P, editor. Goals Project. Baylands Ecosystem Species and Community Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. Oakland, California: San Francisco Bay Area Wetlands Ecosystem Goals Project. San Francisco Bay Regional Water Quality Control Board. p 332-340.

Anderson, W. 1970. A preliminary study of the relationship of salt ponds to wildlife in south San Francisco Bay. Calif. Fish and Game 56:240-252.

Asplund, T. R. 2000. The effects of motorized watercraft on aquatic ecosystems. Wisconsin Department of Natural Resources, Bureau of Integrated Science Services and the University of Wisconsin, Madison Water Chemistry Program. Publication SS-948-00.

Atwater BF. 1979. Ancient processes at the site of southern San Francisco Bay: movement of the crust and changes in sea level. In: Conomos TJ, editor. San Francisco Bay: the urbanized estuary. Menlo Park, CA: U.S. Geological Survey Open File Report 76-389.

Atwater BF, Conrad SG, Dowden JN, Hedel CW, MacDonald RL, Savage W. 1979. History, Landforms, and Vegetation of the Estuary's Tidal Marshes. In: Conomos TJ, editor. San Francisco Bay: The Urbanized Estuary. San Francisco, CA: Pacific Division, American Association for the Advancement of Science. p 347-385.

Atwater BF, Hedel CW, Helley EJ. 1977. Late Quaternary depositional history, Holocene sea-level changes, and vertical crustal movement in southern San Francisco Bay, CA. USGS Professional Paper 1014. 15 pp.

Carney, K.M., and W. J. Sydeman. 1999. A review of human disturbance effects on nesting colonial waterbirds. Waterbirds 22:68-79.

Carpelan LH. 1957. Hydrobiology of the Alviso salt ponds. Ecology 38(3):375-390.

CH2M Hill. 1989. Salt Marsh Conversion in Coyote Creek, 1970 - 1987. 19 pp. and Appendices p.

City of San Jose (1999) General Plan 2020.

Cogswell, HL. 2000. The use of salt ponds by some selected birds other than shorebirds and waterfowl. In: P.R. Olofson, editor. Goals Project. Baylands Ecosystem Species and Community Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. Oakland, CA: San Francisco Bay Area Wetlands Ecosystem Goals Project. San Francisco Bay Regional Water Quality Control Board. p 390-402.

Collins JN, Grossinger RM. 2004. Synthesis of scientific knowledge concerning estuarine landscapes and related habitats of the South Bay Ecosystem. Oakland, CA: San Francisco Estuary Institute. 91 p.

[CNDDB] California Natural Diversity Data Base. 2006. Rarefind. California Department of Fish and Game.

EDAW. 2007. Alviso Slough Restoration Project: Feasible Project Alternatives Technical Memorandum. Prepared for Santa Clara Valley Water District. September 2007. 32 pp.

Feeney, L.R and W.A. Maffei. 1991. Snowy Plovers and their habitat at the Baumberg Area and Oliver Salt Ponds Hayward, California March 1989 through May 1990. Hayward, California: Report prepared for the City of Hayward. 162 p.

Goals Project. 1999. Baylands Ecosystem Habitat Goals. A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. First Reprint. San Francisco, CA/Oakland, CA: U.S. Environmental Protection Agency/San Francisco Bay Regional Water Quality Control Board. 209 p.

Goals Project. 2000. Baylands Ecosystem Species and Community Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. Olofson PR, editor. Oakland, California: San Francisco Bay Area Wetlands Ecosystem Goals Project. San Francisco Bay Regional Water Quality Control Board.

Hamilton, R. B. 1975. Comparative behavior of the American Avocet and the Black-necked Stilt (*Recurvirostridae*). Ornithological Monographs 17.

Hanson, J. T. and D. Kopec 1994. (Revised 2004 by C.M. Strong). Shorebird location and activity during high tides in South San Francisco Bay, 1992-1993, Draft report for the San Francisco Estuary Project: 102.

H. T. Harvey & Associates. 1984. South Bay Dischargers Authority Comparative Study. Project 156-02.

Harvey, T.E., P. R. Kelly, R. W. Lowe, and D. Fearn. 1988. The value of saltponds for waterbirds in San Francisco Bay and considerations for future management; June 26-29, 1988; Oakland, CA. Association of State Wetland Managers.

Harvey, T.E. 1988. Breeding biology of the California Clapper Rail in south San Francisco Bay. Trans. Western Section the Wildlife Society 24:98-104.

Harvey, T. E., R. L. Hothem, R. A. Keck, K. J. Miller, G. W. Page, M. J. Rauzon. 1992. Status and trends report on wildlife of the San Francisco Estuary, U.S. Fish and Wildlife Service.

Harvey, T.E., K.J. Miller, R.L. Hothem, M.J. Rauzon, G.W. Page, and R.A. Keck. 1992. Status and trends report on wildlife of the San Francisco Estuary. U.S. Fish and Wildlife Service, Sacramento, CA.

Harvey, T.E., R.W. Lowe, and D. Fearn. 1988. The value of salt ponds for waterbirds in San Francisco Bay and considerations for future management. National Wetland Symposium, June 26-28, 1988, Assoc. of State Wetland Managers, Oakland, CA

H. T. Harvey & Associates. 1996. Westlake Farms, Inc., Mitigation Assessment Report. Unpublished Report for Westlake Farms, Inc., Stratford, CA. San Jose, California.

H. T. Harvey & Associates. 2005a. Marsh Plant Associations of South San Francisco Bay: 2004 Comparative Study. Project No. 477-27. San Jose, California: Prepared for City of San Jose. 65 p.

H. T. Harvey & Associates, PWA. 2005b. Island Ponds (Ponds A19, A20, A21) Tidal Marsh Establishment Projections. Prepared for: Santa Clara Valley Water District.

Harvey TE. 1988. Breeding biology of the California clapper rail in south San Francisco Bay. Trans. Western Section The Wildlife Society 24:98-104.

Hilton, J. and Phillips, G. L. 1982. The effect of boat activity on turbidity in a shallow broadland river. Journal of Applied Ecology. 19:143-150.

Korschgen, C. E. and R. B. Dahlgren. 1992. Human disturbances of waterfowl: Causes, effects, and management. U.S. Fish and Wildlife Service. pp 1-8

Lafferty, K. D. 2001. Disturbance to wintering Western Snowy Plovers. Biological Conservation 101(3): 315-325.

Lafferty K.D., D. Goodman, C. P. Sandoval. 2006. Restoration of breeding by snowy plovers following protection from disturbance. Biodiversity and Conservation 15: 2217-2230.

Lonzarich DG, Smith JJ. 1997. Water chemistry and community structure of saline and hypersaline salt evaporation ponds in San Francisco Bay, California. Calif Fish and Game 83(3):89-104.

Page, G.W, L.E. Stenzel, J.C. Warriner, and P.W.C. Paton. 1995. Snowy Plover (*Charadrius alexandrinus*). In: A.Pool, F.Gill, editors. The Birds of North America: No. 154. Academy of Natural Sciences, Philadelphia, and American Ornithologists' Union, Washington, DC.

Page G.W. 2001. Preliminary findings from shorebird use of South San Francisco Bay study. Unpublished information prepared for 7/26/01 Salton Sea meeting

PWA, H. T. Harvey & Associates, Brown and Caldwell, EDAW. 2004. Existing Conditions Report, Biology and Habitats, South Bay Salt Pond Restoration Project. San Jose, CA.: Prepared for: California State Coastal Conservancy, U.S. Fish and Wildlife Service, California Department of Fish and Game.

Quammen, M. L. 1982. Influence of subtle substrate differences on feeding by shorebirds on intertidal mudflats. Marine Biology 71:339-343.

Robinson, J. A., L. W. Oring, J. P. Skorupa, and R. Boettcher. 1997. American Avocet (*Recurvirostra americana*). No. 275, A. Poole and F. Gill, editors. The Birds of North America. The Academy of Natural Sciences, Philadelphia, Pennsylvania, USA.

Robinson, J. A., J. M. Reed, J. P. Skorupa, and L. W. Oring. 1999. Black-necked Stilt (*Himantopus mexicanus*). No. 449, A Poole and F. Gill, editors. The Birds of North America. The Academy of Natural Sciences, Philadelphia, Pennsylvania, USA.

Rodgers, J. A., Jr. and H. T. Smith. 1995. Set-back distances to protect nesting bird colonies form human disturbance in Florida. Conservation Biology 9: 89-99.

Rintoul, C., N. Warnock, G. W. Page, and J. T. Hanson. 2003. Breeding status and habitat use of black-necked stilts and American avocets in South San Francisco Bay. Western Birds 34:2-14.

Ruhlen T, D., S. Abbott, L. E. Stenzel, and G. W. Page. 2003. Evidence that human disturbance reduces snowy plover chick survival. Journal of Field Ornithology 74(3): 300-304.

Santa Clara County Parks. Email communication from Mark Frederick at County Parks to Mike Coleman at Santa Clara Valley Water District. September 23, 2008.SBSP Biology and Habitats Existing Conditions Report. H. T. Harvey & Associates, Philip Williams Associates, EDAW, Brown and Caldwell. 2005. San Francisco, CA. Prepared for: California State Coastal Conservancy, U.S. Fish and Wildlife Service, California Department of Fish and Game.

Schummer, M. L. and W. R. Eddleman. 2000. Effects of disturbance on activity and energy budgets of migrating waterbirds in south-central Oklahoma. Journal Wildlife Management 67(4): 789-795.

Siegel SW, Bachand PAM. 2002. Feasibility Analysis, South Bay Salt Pond Restoration. San Rafael, California: Wetlands and Water Resources. 228 p.

Spautz, H. and Nur, N. 2004. Impacts of non-native perennial pepperweed (*Lepidium latifolium*) on abundance, distribution, and reproductive success of San Francisco Bay Tidal Marsh birds. PRBO Conservation Science. Stinson Beach, CA.

Stralberg, D., N. Warnock, N. Nur, H. Spautz, and G. Page. 2003. Predicting the effects of habitat change on South San Francisco Bay bird communities: An analysis of bird-habitat relationships and evaluation of potential restoration scenarios, Habitat Conversion Model, Phase One. Final report to California Coastal Conservancy, September 2003. PRBO Conservation Science, Stinson Beach, CA.

Swarth, C.W., C. Akagi, and P. Metropulos. 1982. The distribution patterns and ecology of waterbirds using the Coyote Hills salt ponds. U.S. Fish and Wildlife Serv., Don Edwards San Francisco Bay Natl. Wildlife Ref., Newark, CA.

Takekawa, J.Y., J. M. Alexander, D. R. Becker, G. W. Page. 2000. Waterfowl and shorebirds of the San Francisco Estuary. In: P.R. Olofson, editor. Goals Project. Baylands Ecosystem Species and Community Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. Oakland, CA: San Francisco Bay Area Wetlands Ecosystem Goals Project. San Francisco Bay Regional Water Quality Control Board. p 309-316.

Takekawa, J.Y., C. Lu, R. Pratt. 2001. Avian communities in baylands and artificial salt evaporation ponds of the San Francisco Bay estuary. Hydrobiologia 466: 317-328.

Thelander CG, M. C. 1994. Life on the edge: a guide to California's endangered natural resources. Santa Cruz, CA.: BioSystems Books. 550 p.

Trulio LA, Evens. JG. 2000. California Black Rail. In: Olofson P, editor. Goals Project. Baylands Ecosystem Species and Community Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. Oakland, CA: San Francisco Bay Area Wetlands Ecosystem Goals Project. San Francisco Bay Regional Water Quality Control Board. p 342-345.

Trulio, L.A., J. C. Callaway, E. S. Gross, J. R. Lacy, F. H. Nichols, J. Y. Takekawa. 2004. South Bay Salt Pond Restoration Project Science Strategy: A Framework for Guiding Scientific Input into the Restoration Process.

[USACE] U. S. Army Corps of Engineers. 1987. Corps of Engineers Wetlands Delineation Manual Environmental Laboratory.

[USACE] U.S. Army Corps of Engineers. 2006. Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region. December 2006. U.S. Army Engineer Research and Development Center.

[USFWS] U.S. Fish and Wildlife Service. 1984. Salt marsh harvest mouse and California clapper rail Recovery Plan. Portland: U. S. Fish and Wildlife Service. 141 p.

Warnock, N., G.W. Page, M. Ruhlen, N. Nur, J.T. Takekawa, and J.T. Hanson. 2002. Management and conservation of San Francisco Bay salt ponds: effects of pond salinity, area, tide, and season on Pacific Flyway waterbirds. Waterbirds 25 (Special Publication 2):79-92.

Warnock, N. 2004. Managing salt ponds to protect migratory bird diversity and abundance. Unpublished science synthesis for the Science Team of the South Bay Salt Pond Restoration Project

Warwick RM, Price R. 1975. Macrofauna production in an estuarine mud flat. Journal of the Marine Biological Association of the United Kingdom 55(1):1-18.

Yousef, Y.A., McLellon, W. M., and Zebuth, H. H. 1980. Changes in phosphorus concentrations due to mixing by motorboats in shallow lakes. Water Research. 14:841-852.

Personal Communications

Boursier, pers. Comm.. 2007.

Laine, pers. comm.2006.

Porcella, pers. comm. 2006.

S. Rottenborn, pers. Obs.

Unpublished Data

Howard Shellhammer, Unpublished Data.

Santa Clara County Bird Data. Unpublished. Data compiled by William G. Bousman for the Santa Clara Valley Audubon Society.

U.S. Geological Survey. Unpublished Data, 2005. Preliminary data collected under contract to the California Coastal Conservancy for use by the South Bay Salt Ponds Restoration Project.

(3.5) Public Health and Vector Management

Alameda County Mosquito Abatement District. 1999. Alameda County Mosquito abatement district control program.

Bailey SF, Eliason DA, Hoffman BL. 1965. Flight and dispersal of the mosquito *Culex tarsalis* Coquillett in the Sacramento Valley of California. Hilgardia 37(3):73-113.

Bohart RM, Washino RK. 1978. Mosquitoes of California: 3rd Edition. Univ. Calif. Div. Agr. Sci., Berkeley, Publ. 4084. 153 pp.

Clarke JL. 1943. Studies of the flight range of mosquitoes. J. Econ. Ent. 36:121-122.

Durso SL. 1996. The Biology and Control of Mosquitoes in California. In: Durso SL, editor: Mosquito and Vector Control Association of California, Elk Grove. 150 pp.

EDAW. 2007. Alviso Slough Restoration Project: Revised Draft Problem Definition and Refined Objectives Report. Prepared for Santa Clara Valley Water District. Project Number 30154029

Maffei WA. 2000d. Summer Salt Marsh Mosquito, *Aedes dorsalis*. In: Olofson PR, editor. Goals Project. Baylands Ecosystem Species and Communities Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. Oakland, CA: San Francisco Bay Area Wetlands Ecosystem Goals Project. San Francisco Bay Regional Water Quality Control Board. p 167-168.

Maffei WA. 2000e. Washino's Mosquito, *Aedes washinoi*. In: Olofson PR, editor. Goals Project. Baylands Ecosystem Species and Communities Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. Oakland, CA: San Francisco Bay Area Wetlands Ecosystem Goals Project. San Francisco Bay Regional Water Quality Control Board. p 172-173.

Maffei WA. 2000f. Western Encephalitis Mosquito, *Culex tarsalis*. In: Olofson PR, editor. Goals Project. Baylands Ecosystem Species and Communities Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. Oakland, CA: San Francisco Bay Area Wetlands Ecosystem Goals Project. San Francisco Bay Regional Water Quality Control Board. p 173-177.

Maffei WA. 2000g. Winter Marsh Mosquito, *Culiseta inornata*. In: Olofson PR, editor. Goals Project. Baylands Ecosystem Species and Communities Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. Oakland, CA: San Francisco Bay Area Wetlands Ecosystem Goals Project. San Francisco Bay Regional Water Quality Control Board. p 177-179.

Maffei WA. 2000h. Winter Salt Marsh Mosquito, *Aedes squamiger*. In: Olofson PR, editor. Goals Project. Baylands Ecosystem Species and Communities Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. Oakland, CA: San Francisco Bay Area Wetlands Goals Project. San Francisco Bay Regional Water Quality Control Board. p 169-172.

Rees DM, Nielsen LT. 1947. On the biology and control of Aedes dorsalis (Meigen) in Utah. Proc. N.J. Mosq. Exterm. Assoc. 34:160-165 p.

San Francisco Bay Joint Venture. 2004. West Nile virus strategy and communications plan. Unpublished report. 13 p.

Strickman D. 2005. Memo summarizing a meeting with the U.S. Army Corps of Engineers concerning mosquito habitats and the South Bay Shoreline Study. San Jose, CA: Santa Clara County Vector Control.

Telford AD. 1958. The pasture Aedes of Central and Northern California. Seasonal History. Ann. Ent. Soc. Amer. 51:360-365.

Washino RK, Jensen T. 1990. Biology, ecology, and systematics of Aedes dorsalis, Ae. melanimon, and Ae. campestris in western North America. Univ. Calif. Ann. Rep. Mosq. Cont. Res(40-41).

(3.6) Geology and Soils

Blake, Thomas F., 2005, EQSearch – A Computer Program for the Estimation of Peak Horizontal Acceleration from California Historical Earthquake Catalogs.

California Geological Survey (CGS), 2001, Seismic Hazard Zone Report for the Milpitas 7.5-Minute Quadrangle, Alameda and Santa Clara Counties, California, Seismic Hazard Zone Report 051, 55p.

CGS, 2007, Probabilistic Seismic Hazards Mapping Ground Motion Page, web site accessed July 2007, http://www.consrv.ca.gov/cgs/rghm/pshamap/pshamap.asp.

Graymer, R. W., McLaughlin, R., Stanley, R.G., Ponce, D.A., Jachens, R.C., Simpson, R.W., and Wentworth, C.M., 2005, Santa Clara Valley-Bounding faults Characterized by Structural Superposition, Geological Society of America, Cordilleran Section Annual Meeting, Abstracts with Programs, Vol. 37, p. 58.

Helley, E.J., and Graymer, R.W, 1997, Quaternary Geology of Alameda County, and Parts of Contra Costa, Santa Clara, San Mateo, San Francisco, Stanislaus, and San Joaquin Counties, California: A Digital Database, US Geological Survey, Open-File Report OF97-97.

Moffatt and Nichol Engineers, July 2005, Urban Levee Flood Management Requirements, South Bay Salt Pond Restoration Project, for California State Coastal Conservancy.

Schmidt, D. and Bürgmann, R., 2002, Land Uplift and Subsidence n the Santa Clara Valley, in: Berkeley Seismological Laboratory Annual Report 2001-2002, Chapter 15, No. 8, page 141-143. Accessed on-line: http://seismo.berkeley.edu/annual_report/ar01_02/node26.html.

U.S. Geological Society (USGS), 2003, (WG99), Earthquake Probabilities in the San Francisco Bay Region: 2002-2031, by Working Group on California Earthquake Probabilities, Open-File Report 03-214.

USGS, 2007, Quaternary Fault and Fold Database of the United States, web site accessed July 2007, http://earthquake.usgs.gov/regional/qfaults/index.php.

Witter, Robert C., Knudsen, Keith L., Sowers, Janet M., Wentworth, Carl M., Koehler, Richard D., and Randolph, Carolyn E., 2006, Maps of Quaternary Deposits and Liquefaction Susceptibility in the Central San Francisco Bay Region, California, Part 3: Description of Mapping Liquefaction Interpretation, US Geological Survey, Open-File Report 2006-1037.

(3.7) Hazards and Hazardous Materials

EarthTech. 2006. Final Phase I Hazardous Substance Liability Assessment Alviso Slough Restoration Project. January 16.

Kleinfelder, Inc. 2006. Phase I Environmental Site Assessment Gold Street Education Center. May 15.

(3.8) Air Quality

Ahrens, D. C. 2003. *Meteorology Today; an Introduction to Weather, Climate, & the Environment.* Brooks Cole, Inc. Pacific Grove, CA.

Bay Area Air Quality Management District (BAAQMD). 1999. CEQA Guidelines.

Bay Area Air Quality Management District (BAAQMD). 2007. General Information. Available http://www.baaqmd.gov/. Accessed November 2007.

California Air Resources Board (CARB). 2003. HARP User Guide. Sacramento, CA

California Air Resources Board (CARB). 2005. Air Quality and Land Use Handbook: A Community Health Perspective. Sacramento, CA.

California Air Resources Board (CARB). 2006a. *California Almanac of Emissions and Air Quality 2006 Edition.* Sacramento, CA.

California Air Resources Board (CARB). 2007a. *2006 Estimated Annual Average Emissions San Francisco Bay Area Air Basin.*

California Air Resources Board (CARB). 2007b. *Air Quality Data Summaries - Top 4 Summary: Select Pollutant, Years, and Area.* Available at http://www.arb.ca.gov/adam/cgi-bin/db2www/adamtop4b.d2w/start. Accessed November 2007.

California Air Resource Board (CARB). 2007c. *State and National Area Designations*. Available at http://www.arb.ca.gov/desig/adm/adm.htm#state. Accessed November 2007.

California Energy Commission. 2006. *Inventory of California Greenhouse Gas Emissions and Sinks:1990 to 2004.* (Staff Final Report). Publication CEC-600-2006-013-SF. Available: <http://www.climatechange.ca.gov/policies/greenhouse_gas_inventory/index.html> and <http://www.energy.ca.gov/global_climate_change/inventory/documents/index.html>.

Godish, T. 2004. Air Quality. Lewis Publishers, Inc. Boca Raton, FL.

Intergovernmental Panel on Climate Change. 2007 (February). *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC.* Geneva, Switzerland.

Seinfeld, J. H., and S. N. Pandis. 1998. *Atmospheric Chemistry and Physics*. John Wiley & Sons, Inc. New York, NY.

U.S. Environmental Protection Agency (EPA). 2007a. *Criteria Air Pollutant Information*. Available < http://www.epa.gov/air/urbanair/6poll.html>. Accessed November 2007

U.S. Environmental Protection Agency (EPA). 2007b. *Monitor Value Report*. Available at: www.epa.gov/air/data/geosel.html. Accessed: November 2007.

U.S. Environmental Protection Agency (EPA). 2007c. *National Ambient Air Quality Standards.* Available at http://www.epa.gov/air/criteria.html. Accessed November 2007.

Zhu, Yifang, W. C. Hinds, S. Kim, and S. Shen. 2002. Study of Ultrafine Particles Near a Major Highway with Heavy-duty Diesel Traffic. *Atmospheric Environment* 36:4323-4335.

Personal Communications

Salinas, Julio. Staff Toxicologist. Office of Health Hazard Assessment, Sacramento, CA. August 3, 2004—telephone conversation with Kurt Legleiter of EDAW regarding exposure period for determining heath risk.

(3.9) Noise

California Department of Transportation. 1998 (October). *Technical Noise Supplement.* Traffic and Vehicle Data Systems Unit Available <http://www.dot.ca.gov/hq/env/noise/pub/Technical%20Noise%20Supplement.pdf>.

———. 2002 (February 20). *Transportation Related Earthborne Vibrations*. Sacramento, CA.

———. 2006 (November). *2005 Annual Average Daily Truck Traffic on the California Stat highway System*. Sacramento, CA.

Caltrans. *See* California Department of Transportation.

City of San Jose. 1994 . *City of San Jose General Plan 2020.* Originally adopted in 1994. San Jose, CA.

Egan, M. David. 1988. *Architectural Acoustics*.

Federal Highway Administration. 1988. Traffic Noise Prediction Computer Model. Washington, DC.

Federal Railway Administration. 1998 (December). *High-Speed Ground Transportation Noise and Vibration Impact Assessment.* Washington, DC. Available <www.fra.dot.gov/downloads/RRDev/nvman.pdf>.

Federal Transit Administration. 2006 (May). *Transit Noise & Vibration Impact Assessment* (FTA Report VA-90-1003-06). Washington, DC.

———. *General Transit Noise Assessment Model.* Available at <www.fta.dot.gov/transit_data_info/reports_ publications/publications/environment/1165_5953_ENG_HTML.htm>.

FHWA. *See* Federal Highway Administration.

FRA. *See* Federal Railway Administration.

Lipscomb, D.M., and A.C. Taylor, Jr. (eds.). 1978. *Noise Control: Handbook of Principles and Practices*. Van Nostrand Rheinhold Company. New York, NY.

Lund, Dee. Union Pacific Railroad Government Affairs Office. June 17, 2005—personal communication with Austin Kerr of EDAW, Sacramento, CA.

Paul S. Veneklasen & Associates. 1973. *Noise Insulation Problems in Buildings.* Cited in California Department of Transportation, Division of Aeronautics. 2002.

State of California Governor's Office of Planning and Research. 2003. *General Plan Guidelines*. Sacramento, CA.

(3.10) Land Use and Planning

City of San Jose. 2004. *San Jose 2020 General Plan.*

City of San Jose. 1998. *Alviso Master Plan.*

(3.11) Recreation

U.S. Fish and Wildlife Service and California Department of Fish and Game. June 2003. *South Bay Salt Ponds Initial Stewardship Plan.*

U.S. Fish and Wildlife Service and California Department of Fish and Game. December 2003. *South Bay Salt Ponds Initial Stewardship Plan Draft Environmental Impact Report/Environmental Impact Statement.*

San Jose, City of, Department of Parks Recreation and Neighborhood Services *http://www.sjparks.org/Trails/Bay/BayTrail.asp*, accessed January 19, 2009.

(3.12) Cultural and Historic Resources

Beck, W. A., and Y. D. Haase. 1974. Historical Atlas of California. University of Oklahoma Press.

Bennyhoff, J. A. 1982. Central California Augustine: Implications for Northern California Archaeology. Contributions of the University of California Archaeological Research Facility, Berkeley 52:65–74.

Bennyhoff, J. A. 1977. Ethnogeography of the Plains Miwok. University of California, Center for Archaeological Research at Davis, Publications 5.

Bennyhoff, J.A. 1968. A Delta Intrusion to the Bay in the Late Middle Period in Central California. San Diego: Paper presented at the Annual Meeting of the Society for California Archaeology and the Southwestern Anthropological Association.

Bennyhoff, J. A., and D. A. Fredrickson. 1969. A Proposed Integrative Taxonomic System for Central California Archaeology. Contributions of the University of California Archaeological Research Facility, Berkeley 52:15–24.

Bickel, P.McW. 1978. Changing Sea Levels Along the California Coast: Anthropological Implications. Journal of California Anthropology Volume 5 No. 1. Pp 6-20.

Butler, P.F. 1981. The Valley of Santa Clara Historic Buildings, 1792-1920. Presidio Press, Novato, California.

Fredrickson, D.A. 1974. Cultural Diversity in Early Central California: A View from the North Coast Ranges. Journal of California Anthropology 1(1):41–53.

Fredrickson, D.A. 1973. Early Cultures of the North Coast Ranges, California. Unpublished Ph.D. Dissertation. Department of Anthropology, University of California, Davis.

Gifford, E.W. 1916. Composition of California Shellmounds. University of California Publications American Archaeology and Ethnology Vol. 12 No. 1.

Heizer, R.F. and F. Fenenga. 1939. Archaeological Horizons in Central California. American Anthropologist 41.

Hope, A., M. Hylkema, and T. Van Buren. 1996. Archaeological Survey and Historical Resource Evaluation Report for the Baumberg Biological Mitigation Tract, Alameda County. Report prepared for California Department of Transportation District 4 – Oakland.

Jones & Stokes. 2001. Cultural Resources Inventory Report for the Habitat Mititgation Planning Sites, San Francisco International Airport Proposed Runway Reconfiguration Program. Prepared for San Francisco International Airport.

Kroeber, A. L. 1959. Ethnographic Interpretations: 9. Recent Ethnic Spreads. University of California Publications in American Archaeology and Ethnology 47(3).

Kroeber, A.L. 1925. Handbook of the Indians of California. Bureau of American Ethnology Bulletin 78.

Kyle, D. 2002. Historic Spots in California. Stanford University Press, Stanford, California.

Levy, R. 1978. Costanoan. In Handbook of North American Indians, Vol. 8. Smithsonian Institution, Washington, D.C.

Lightfoot, K.G. 1997. Cultural Construction of Coastal Landscapes: A Middle Holocene Perspective from San Francisco Bay. In Archaeology of the California Coast during the Middle Holocene, J.M. Erlandson and M.A. Glassow, eds. Perspectives in California Archaeology, Volume 4. Institute of Archaeology, University of California, Los Angeles.

Milliken, R. 1995. A Time of Little Choice: The Disintegration of Tribal Life in the San Francisco Bay Region. Ballena Press Anthropological Papers No. 43. Menlo Park.

Milliman, J.D., and K.O. Emery. 1968. Sea Levels During the Past 35,000 Years. Science 162:1121-1123.

Moratto, M. J. 1984. California Archaeology. Academic Press, San Francisco, CA.

Munro-Fraser, J.P. 1881. History of Santa Clara County, California. Alley, Bowen & Co., San Francisco.

Nelson, N.C. 1909. Shellmounds of the San Francisco Bay Region. University of California Publications American Archaeology and Ethnology Vol. 7 No. 4.

Rosenthal, J. 2001. Archaeological Survey and Extended Phase I/Phase II Excavations at CA-ALA-485 and -486 in the Baumberg Ecological Mitigation Tract, Alameda county, California. Report prepared for Army Corps of Engineers by Far Western Anthropological Research Group, Inc.

Tvedt, S. 1975. New Chicago: Land Promotion in Alviso, 1890-1891. Paper on file, California Room, San Jose Public Library, San Jose, California.

Wallace, W. J. 1978. Northern Valley Yokuts. In Handbook of North American Indians, Vol. 8. Smithsonian Institution, Washington, D.C.

Watt, L. 2005. South Bay Salt Pond Restoration Project Historic Context Report. Prepared for California State Coastal Conservancy, U.S. Fish & Wildlife Service, and the California Department of Fish & Game. Report on file, EDAW, Inc., San Francisco, California.

(3.13) Transportation and Traffic

City of San Jose, San Jose General Plan 2020, 2004.

Santa Clara County, Santa Clara County General Plan, Transportation Element, 1994.

City of San Jose Transportation Department, Brad Sedin, Associate Engineer, personal communication with Rudy Calderon, EDAW, October 22, 2007.

Rouhani, Victor. 2007. Associate Engineer, City of San Jose Transportation Department, Personal communication with Elke Rank, EDAW. November 13, 2007.

City of San Jose, Traffic Control Plan Requirements, 2005. http://www.sanjoseca.gov/publicworks/tds/PDFS/Traffic%20Control%20Plan.pdf

(3.14) Public Services

City of San Jose. 2005. San Jose Municipal Code. Adopted December 13. American Legal Publishing Corporation, copyright 2005.

City of San Jose. 2004. San Jose 2020 General Plan.

San Jose Police Department. 2006. Neighborhood Map. http://www.sjpd.org/MyNeighborhoodMap.cfm

Depner, Linda. 2004. Crime Data Specialist, City of San Jose Police Department. Personal communication, September 15, 2004.

Perez, Uvaldo. 2007. Project Manager, Santa Clara County Parks and Recreation Department. Personal communication, November 5, 2007.

Post, Debby. 2005. Secretary, San Jose Fire Department. Personal communication, September 15, 2005.

Rode, Pete. 2004. Captain, Santa Clara County Sheriff's Department. Personal communication, September 16, 2004.

Santa Clara County. 2004. Santa Clara County Office of the Sheriff (http://www.sccgov.org/site/0,4760,sid%253D12655,00.html) accessed via internet by Mary Laux, EDAW, Inc., on September 15, 2004.

Santa Clara County. 2006. About County Parks. http://www.parkhere.org/portal/site/parks/. Accessed June 2007.

City of San Jose Department of Parks, Recreation & Neighborhood Services (PRNS). 2007. Parks. http://www.sjparks.org/. Accessed June 2007.

(3.15) Utilities

California Integrated Waste Management Board (CIWMB). 2007a. Active Landfills Profile for Zanker Road Class III Landfill (43-AN-0007). http://www.ciwmb.ca.gov/Profiles/Facility/Landfill/LFProfile2.asp?COID=7&FACID=43-AN-0007. Accessed July 2007.

California Integrated Waste Management Board (CIWMB). 2007b. Active Landfills Profile for Zanker Road Class III Landfill (43-AN-0007). http://www.ciwmb.ca.gov/Profiles/Facility/Landfill/LFProfile1.asp?COID=43&FACID=43-AN-0003 Accessed October 2007.

Moffatt & Nichol Engineers. 2005. Inventory of Water Conveyance Facilities South Bay Salt Pond Restoration Project. January. http://www.southbayrestoration.org/pdf_files/Conveyance-Report-Full-Jan2005.pdf. Accessed July 2007.

Zanker Material Processing Facility. 2007. http://www.z-best.com/ZMPF/index.html. Accessed July 2007.

(3.16) Aesthetics

City of San Jose Department of Planning, Building and Code Enforcement. 1998. Alviso Master Plan: A Specific Plan for the Alviso Community.

(3.17) Social And Economic Effects, Including Environmental Justice

Association of Bay Area Governments. 2005. ABAG Projections, 2005.

Association of Bay Area Governments. 2007. ABAG Projections, 2007.

California Department of Boating and Waterways. 2002. California Boating Facilities Needs Assessment, Volume 1, Statewide Boaters and Boating Facilities.

Bureau of Economic Analysis, Consumer Price Index, http://www.bls.gov/cpi/, accessed November 2007.

California Department of Boating and Waterways. 2002. California Boating Facilities Needs Assessment, Volume V, Statewide Boaters and Boating Facilities,

United States Department of Housing and Urban Development (HUD). 2000 Census Data, Summarized Low/Mod Data, FY 2007, http://www.hud.gov/offices/cpd/systems/census/ca/index.cfm.

U.S. Census Bureau

1990. DP-2. Social Characteristics for Santa Clara County, City of San Jose, and Tract 5046.98. 1990 Summary Tape File 3 (STF 3). http://factfinder.census.gov. Accessed June 2007.

1990. DP-3. Labor Force Status and Employment Characteristics: 1990 for Santa Clara County, City of San Jose, and Tract 5046.98. 1990 STF 3. http://factfinder.census.gov. Accessed June 2007.

1990. DP-4. Income and Poverty Status in 1989: 1990 for Santa Clara County, City of San Jose, and Tract 5046.98. 1990 STF 3. http://factfinder.census.gov. Accessed June 2007.

1990. DP-5. Housing Characteristics: 1990 for Santa Clara County, City of San Jose, and Tract 5046.98. 1990 STF 3. http://factfinder.census.gov. Accessed June 2007.

2000. P1. Total Population for Santa Clara County, City of San Jose, and Tract 5046.02. 2000 Summary File 1 (SF1). http://factfinder.census.gov. Accessed June 2007.

(4.0) Growth Inducement and Cumulative Analysis

City of San Jose. San Jose 2020 General Plan. http://www.sanjoseca.gov/planning/gp/default.asp. Accessed June 2007.

Santa Clara County Planning Office (SCCPO). 2005. Conditions and Trends in Santa Clara County

State of California, Department of Finance.

2000. City/County Population and Housing Estimates, 1991-2000, with 1990 Census Counts. Sacramento, California, May.

2002. Revised Historical City, County and State Population Estimates, 1991-2000, with 1990 and 2000 Census Counts. Sacramento, California, March.

2007. E-1 Population Estimates for Cities, Counties and the State with Annual Percent Change — January 1, 2006 and 2007. Sacramento, California, May.

2007. E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2007, with 2000 Benchmark. Sacramento, California, May.

2000. DP-1. Profile of General Demographic Characteristics for Santa Clara County, City of San Jose, and Tract 5046.02. 2000 Summary File 1 (SF1). http://factfinder.census.gov. Accessed June 2007.

2000. P53. Median Household Income in 1999 (Dollars). 2000 SF3. http://factfinder.census.gov. Accessed June 2007.

U.S. Fish and Wildlife Service and California Department of Fish and Game. December 2007. South Bay Salt Ponds Restoration Project Draft Environmental Impact Report/ Statement. Prepared with Coastal Conservancy by EDAW.

This page intentionally left blank.

8 EIR Distribution List

The public distribution of the **Alviso Slough Restoration Project Draft and Final EIR** emphasizes the use of electronic media to ensure cost-effective, broad availability to the public and interested parties. The Draft EIR is available on the internet at:

http://www.valleywater.org/News_and_events/CEQA_public_review/index.shtm

All Persons, agencies, and organizations listed in this chapter have been informed of the availability of and locations to obtain the Draft and Final EIR, as well as the timing of the 45-day public/agency comment period.

Parties listed below have received either 1) the Notice of Completion (NOC) which describes the project (paper copy); or 2) the NOC (paper copy) plus the full Draft EIR (paper copy); or 3) the NOC (paper copy) plus an electronic copy (CD) of the Draft EIR and appendices; or 4) in the case of the State Clearinghouse, the NOC (paper copy) plus the full Draft EIR (paper copy) plus an electronic copy (CD) of the Draft EIR and appendices.

The Draft EIR is also available for review at the locations listed below.

8.1 DOCUMENT AVAILABILITY

Copies of the Draft and Final EIR are available for public review at the following locations:

- Alviso Branch Library: 5050 North First Street, San Jose, CA 95002
  Phone: 408-263-3626
- Dr. Martin Luther King, Jr. Library: 150 E. San Fernando Street, San Jose, CA 95112
  Phone : 408-808-2000
- Santa Clara Valley Water District, 5750 Almaden Expressway, San Jose, CA 95118
  Phone: 408-265-2600

8.2 AGENCIES AND ORGANIZATIONS RECEIVING COPIES OF THE DRAFT EIR

Paper copies of the Notice of Completion (NOC), ~~and/or~~ Draft EIR (paper or CD), and/or Final EIR (paper or CD) were sent to the following agencies and organizations:

State Clearinghouse

Alviso Branch Library

Martin Luther King, Jr. Library

Alviso Marina County Park

ABAG Bay Trail, Project Manager

Alviso Water Task Force

Bay Area Air Quality Management District

Berryessa Sun Newspaper

Blue Whale Sailing School

California Assemblywoman Sally J. Lieber

California Dept. of Boating & Waterways

California Dept. of Fish & Game

California Native Plant Society (Santa Clara Valley Chapter)

California Sportfishing Protection Alliance

California State Coastal Conservancy

California State Lands Commission (CSLC)

California State Senator Ellen Corbett

California State Water Resources Control Board

Cargill Salt Company

Citizens Committee to Complete the Refuge

City of San Jose, District 4 Councilmember Kansen Chu

City of San Jose, Dept. of Planning, Building & Code Enforcement

City of San Jose, Environmental Services

City of San Jose Fire Dept.

City of San Jose, Parks and Recreation Department

City of San Jose, Planning Department

City of Sunnyvale

Clean South Bay

Communities for a Better Environment

Congressman Mike Honda

Ducks Unlimited

Environmental Defense Fund

Friends of the San Francisco Estuary

Greenbelt Alliance

Guadalupe-Coyote Resource Conservation District

Human Computing

Mid-Peninsula Open Space District

Natural Heritage Institute

Natural Resources Defense Council

NOAA-National Marine Fisheries Service

Ohlone Audubon Society

Pacific Coast Federation of Fishermen's Associations

PG&E

Recreational Boaters of California
San Francisco Bay Bird Observatory
San Francisco Bay Conservation and Development Commission
San Francisco Bay Joint Venture
San Francisco Bay Regional Water Quality Control Board (SFRWQCB)
San Francisco Baykeeper
San Francisco Estuary Institute (SFEI)
San Jose Sailing Club
Santa Clara Basin Watershed Mgmt. Initiative (WMI)
Santa Clara County Open Space Authority
Santa Clara County Parks and Recreation Department
Santa Clara Valley Audubon Society
Santa Clara County Supervisor Pete McHugh
Santa Clara Valley Transportation Authority
Save The Bay
Schaaf & Wheeler
Senator Dianne Feinstein
Sierra Club, Loma Prieta Chapter
Sommerset Mobile Park
South Bay Salt Ponds Restoration Project
South Bay Yacht Club
Star of the Sea – People Acting in Community Together (PACT)
The Bay Institute of San Francisco
Trinity Park HOA
Trout Unlimited of California
Union Pacific Railroad Company
U.S. Army Corps of Engineers (USACE)
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service (Don Edwards Refuge)
United States Geological Survey (USGS)
Western Waters Canoe Club
Zanker Landfill
Members of the public who attended and signed in at previous project public meetings

This page intentionally left blank.